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MR. PRESIDENT AND GENTLEMEN,—The serum reactions are those which take place between an antigen and its homologous antiserum. Of the chemical nature of antigens we have no certain knowledge. Examples are bacteria and their products, red cells and blood serum when injected into an animal of different species. Substances capable of acting as antigens appear to be attached to protein matter and have not as yet been isolated in a pure state. Attempts have been made to show that antigens are of a lipoid nature. Antigen-containing substances have been extracted with alcohol and ether, and the material obtained after evaporation of the solvent has been injected into animals (Bang and Forssman, 1906, and others). The results obtained have not been conclusive (Ritchie and Miller, 1913). In this connexion it must be remembered that antigens are active in very small amounts, and that an ethereal solution of lipoids, although apparently perfectly clear, may well contain minute fragments of protein matter in suspension. Moreover, substances not usually soluble in fat solvents may be dissolved or taken up as a very fine suspension in the presence of lecithin. A chloroform solution of lecithin is able to take up or dissolve such substances as cobra venom, trypsin, rennet, and even oxide of iron. In no case, so far as I am aware, has the injection of a pure substance of well-defined chemical constitution been followed by the formation of antibodies. Our definition of antigen is a substance the introduction of which into the animal body is followed by the formation of a specific antibody.

It is usually held (Pick, 1902) that the antibodies are for the greater part precipitated with the globulins of the serum, with the pseudoglobulin fraction in the case of the horse, with the euglobulin fraction in the case of the goat. Moreover, an increase in the globulins of the serum during the process of immunisation has, on several occasions, been observed. It is, however, probable that euglobulin and pseudoglobulin merely represent different phases of physical aggregation of their constituent particles, and the difference between even albumin and globulin may be of a physical rather than chemical nature. From this point of view, the fact that the greater part of the antibody in a serum is precipitated with any particular fraction of globulin yields no information as to the chemical nature of the actual antibody. As a matter of fact, it was shown by Ledingham (1907) that the ratio of distribution of antitoxin among the various serum proteins—euglobulin, pseudoglobulin, and albumin—differed considerably at different stages of the process of immunisation. We may suppose that the process of immunisation is accompanied by a disturbance of the physical state of the serum proteins, and the regrouping of protein molecules may lead to an increase in the globulin fraction.

As to the chemical nature of antigen and antibody we are in complete ignorance. When, however, antigen is mixed with antibody a reaction takes place, and the occurrence of this reaction can be shown by certain phenomena known as the serum reactions. These reactions are: 1. *The precipitation reaction.* When a normal serum or a bacterial extract is mixed with its homologous antiserum a precipitate is formed. 2. *The agglutination reaction.* When a suspension of red blood corpuscles or bacteria is mixed with homologous antiserum the bacteria or cells are agglutinated to form clumps. 3. *Lysis.* When red corpuscles or bacteria are mixed with antiserum or complement the cells are dissolved, or at any rate some change takes place which leads to the escape of the intracellular contents. 4. *Complement fixation.* When antigen is mixed with antiserum and complement, the complement is used up, and if subsequently there be added a mixture of red blood corpuscles and homologous antiserum the fixation of the complement can be demonstrated by the absence of hæmolysis. 5. *The opsonic reaction.* If red cells or bacteria are treated with antiserum the cells or bacteria are so altered that they are more readily ingested by phagocytes. This reaction is more marked in the presence of complement.

THEORIES IN EXPLANATION OF THE SERUM REACTIONS.

Two main theories have been advanced to explain these reactions: the theory of Ehrlich and the theory of Bordet. The former theory assumes a chemical union between the antigen and the antibody; the other interprets the reactions as adsorption phenomena in which the antibody is adsorbed by the antigen. In spite of some opposition, the theory of Ehrlich has acquired a dominant position in medical literature, and its general outline is familiar to all who have even the scantiest knowledge of medical sciences.

According to the views of the Ehrlich school each of the serum reactions is due to the existence of a separate and particular antibody. These various and hypothetical antibodies have been arranged in three classes. *Receptors of the first order:* To this class belong the antitoxins, which possess a haptophore group, a grouping of atoms capable of satisfying the affinities of the corresponding grouping in the haptophore molecule of the homologous toxin. The toxin molecule is thus rendered harmless, for it is no longer able to combine with the cells of the body. *Receptors of the second order:* These have, in addition to the haptophore group, a second group, the ergophore group, which by virtue of its chemical constitution is able to bring about the change peculiar to the particular type of antibody. To this class belong the precipitins and agglutinins. The haptophore group of the agglutinin combines with the bacterium, and subsequently the ergophore group proceeds to produce agglutination. *Receptors of the third order:* In addition to the haptophore group the antibodies possess a complementophile group, which combines with a substance called complement which is necessary to complete the lysis of a corpuscle or bacterium. The antibodies concerned in the complement-fixation reaction are held by many to constitute a separate class of amboceptor, and the opsonins or bacteriotropins are also considered to belong to this group.

It is assumed, then, that each serum reaction is an entirely separate and distinct phenomenon, the result of the action of a highly specialised chemical substance expressly manufactured for the purpose. A precipitin is a body which combines with homologous antigen, and then by virtue of a special chemical formula proceeds to precipitate it. It is entirely distinct from the complement-binding amboceptor, which is structurally adapted to perform the specific function of complement fixation. It is manifest that the side-chain theory affords no explanation whatever of the mechanism of the serum reactions. It may, as a matter of mere terminology, be convenient to say that any serum contains an agglutinin for *B. typhosus*, but the process of agglutination is in no way explained by saying that the agglutinin possesses two groups, the one a haptophore which combines with the bacillus, the other an ergophore which produces agglutination. We already know that clumping occurs and that the reaction is specific. Ignorance, however aptly veiled in an attractive terminology, remains ignorance.

With each addition to the store of experimental fact new substances have been imagined and endowed with the appropriate functions. To difficulties in the interpretation of the reaction between toxin and antitoxin we owe the coining of such words as prototoxoid, syntoxoid, and epitoxoid. The observation that bacteriolysis does not occur in the presence of a great relative excess of antiserum led Neisser and Wechsberg (1901) to elaborate the hypothetical conception of complement deviation[1] (*Komplement-Ablenkung*). The experimental facts are explained in this case by supposing that free amboceptors have a greater affinity for complement than those which have effected union with the receptors of the bacillus. Ferrata (1907) showed by precipitating the euglobulin of fresh serum that two substances appeared to be necessary for complement action. The names mid-piece and end-piece fraction of the complement were accordingly coined, and the diagrams which accompany Brand's article (1907) are examples of the attempt to make new experimental data conform to the limits of a ruling hypothesis.

[1] Complement deviation (*Ablenkung*) should not be confused with the more familiar complement fixation (*Bindung*).

A theory, right or wrong, is of value as long as it tends to progress and further investigation, and it is notorious that the researches of Ehrlich and his school have yielded results of high theoretical interest and great practical value, in the realms alike of diagnosis and therapeutics. Nevertheless, the outstanding genius of Ehrlich and the greatness of his discoveries have tended to give to the theory associated with his name a position comparable to that of a well-known law of physical or biological science. New observations have been held to be explained if they were shown to be consistent with the side-chain hypothesis. But agglutinins, precipitins, amboceptors are mere words, and a passive belief in the existence of such bodies tends to impede rather than advance our understanding of what is actually taking place. In our present state of ignorance of the nature of the reaction it seems undesirable to use a terminology which implies a knowledge which we do not possess.

We know that when substances containing antigens are mixed with substances containing antibodies a change takes place, and we can obtain indirect evidence of this change by observing certain phenomena such as precipitation, agglutination, or lysis. It seems to me probable that these phenomena are the result of one fundamental reaction which takes place between antigen and antibody. The so-called serum reactions, precipitation, agglutination, lysis, complement fixation, and the opsonic reaction constitute different methods for the indirect observation of one reaction which underlies and is essential to them all.[2] They are, in fact, accessory phenomena, and their demonstration is dependent on accessory characteristics in the reagents which we employ. For all the reactions which can be demonstrated in a test-tube it is only necessary to postulate one kind of antibody.

PRECIPITATION.

This is a reaction which is usually demonstrated by mixing antiserum with an antigen-containing fluid. According to the side-chain hypothesis the antiserum contains an active substance, the precipitin which precipitates the antigen, called in this reaction the precipitinogen. That any person who had carried out many precipitation reactions should continue to hold this view is not a little surprising. In practice relatively large amounts of antiserum are invariably employed, while the antigen-containing serum may be employed in quantities of 0·0001 c.c., 0·00001 c.c., or in exceptional cases still smaller amounts. That a fairly abundant and easily visible precipitate could be derived from such a minute quantity of antigen is scarcely conceivable. It is to Welsh and Chapman (1906 to 1910) that we owe a most important observation on this subject. These workers showed by gravimetric methods that, under the usual experimental conditions, the greater part, if not all of the precipitate was derived from the antiserum. Table I., abbreviated from a paper in the Proceedings of the Royal Society (1907) by Welsh and Chapman, illustrates this point.

TABLE I.

No. of experiment.	Weight of egg-white homologous protein (dried).	Amount of antiserum (fresh).	Weight of precipitum (dried).
1	2·5 mg.	19 c.c.	18·0 mg.
2	2·5 mg.	20 c.c.	18·0 mg.
5 (*a*)	1·0 mg.	18 c.c.	13·0 mg.
5 (*b*)	Superfluid of 5 (*a*).	16 c.c.	8·5 mg.
5 (*c*)	,, ,, 5 (*b*).	18 c.c.	4·4 mg.

In experiment (1) 2·5 mg. dried hen egg-white interacted once with 19 c.c. fresh hen egg antiserum and caused the formation of a deposit weighing 18 mg., or more than seven times the weight of the homologous protein concerned. In experiment (5) 1 mg. of dried hen egg-white, interacting (*a*) with 18 c.c. fresh hen egg antiserum, brought down a deposit of 13 mg. The residual protein in the clear superfluid, interacting (*b*) with 16 c.c. of a second fresh hen egg antiserum, gave a further deposit of 8·5 mg. The resulting superfluid, again interacting (*c*) with 18 c.c. of a third egg antiserum, gave a third deposit of 4·4 mg. Thus by allowing 1 mg. of the homologous protein to interact successively with three antisera (which did not mutually interact), a total deposit of 25·9 mg. was obtained.

[2] The reaction which takes place between toxin and antitoxin is not accompanied by any change which can be demonstrated *in vitro* and appears to be of a somewhat different nature to that which takes place in the serum reactions, which are here considered.

On the other hand, the weight of the precipitate is directly proportional to the amount of antiserum, provided that the mixture contains sufficient antigen to precipitate all the precipitable matter in the antiserum. This second point is illustrated in Table II. taken from Chapman's paper in the Proceedings of the Royal Society (1910).

TABLE II.

Weight of dried egg-white.	Volume of antiserum.	Weight of precipitate.	Weight of precipitate from 1 c.c. antiserum.
14·4 mg.	2 c.c.	3·2 mg.	1·6 mg.
36·0 mg.	2 c.c.	3·5 mg.	1·75 mg.
144·0 mg.	2 c.c.	3·4 mg.	1·7 mg.
432·0 mg.	2 c.c.	3·4 mg.	1·7 mg.

If, however, the mixture contains an insufficient quantity of antigen precipitation is incomplete and a smaller precipitate is obtained. The proof given by Welsh and Chapman that under the usual experimental conditions it is the antiserum which is precipitated by the antigen is of far-reaching importance. It casts an entirely fresh light not merely on the precipitation reaction, but on the other serum reactions as well.

Before leaving the subject of precipitation it is necessary to refer to the importance of the relative proportions of antigen and antiserum in the mixture. The importance of this factor is shown in Table III. (Dean, 1911):—

TABLE III.

—	5 c.c. dilutions of normal horse serum (antigen).	5 c.c. of a 1 in 5 dilution of rabbit *v.* horse serum (antibody).	5 c.c. of a 1 in 10 dilution of rabbit *v.* horse serum.	5 c.c. normal saline solution.
1	Undiluted serum.	70 c.mm.	5 c.mm.	Clear.
2	Diluted 1 in 2	140 ,,	30 ,,	,,
3	,, 1 in 4	190 ,,	65 ,,	,,
4	,, 1 in 8	200 ,,	80 ,,	,,
5	,, 1 in 16	110 ,,	120 ,,	,,
6	,, 1 in 32	60 ,,	60 ,,	,,
7	,, 1 in 64	40 ,,	25 ,,	,,
8	,, 1 in 128	30 ,,	15 ,,	,,
9	,, 1 in 256	20 ,,	7·5 ,,	,,
10	,, 1 in 512	10 ,,	5 ,,	,,
11	,, 1 in 1024	7·5 ,,	Less than 5	,,
12	5 c.c. normal saline solution.	Clear.	Clear.	—

Three sets of dilutions of horse serum were prepared. To one set was added an equal quantity of a 1 in 5 dilution of antiserum, to another set was added a 1 in 10 dilution of the antiserum. The third set received an equal quantity of normal saline solution, and acted as an antigen control. The antiserum controls are shown in the tubes numbered 12. All the tubes were incubated for four hours at 37° C., and then placed overnight in the cold room. The tubes were then centrifugalised for one hour. The tubes ended in a narrow portion, which was calibrated in such a way that the amount of the precipitate could be accurately determined. The relative quantities of the precipitate in each tube are indicated by the figures, which give the volume of the precipitate in cubic millimetres.

With a 1 in 5 dilution of antiserum the largest precipitate was obtained by adding a 1 in 8 dilution of antigen. With half the quantity of antiserum (1 in 10) the largest precipitate was obtained by adding a 1 in 16 dilution of antigen. The largest precipitate obtained with the 1 in 10 dilution of antiserum was about half the largest amount obtained by the use of twice as much antiserum (1 in 5 dilution). For any quantity of antiserum there exists a quantity of antigen which is capable within a definite period of time of producing the largest precipitate obtainable from such a quantity of antiserum. Table III. also illustrates very clearly the inhibitory effect of relative excess of antigen. This is plainly seen by comparing the figures in the two columns. A 1 in 4 antigen dilution, which constituted a marked antigen excess for an equal quantity of 1 in 10 antiserum, produced almost the largest precipitate of the series when mixed with a 1 in 5 dilution of antiserum.

The relative proportions of antigen and antibody constitute a factor which is present in all the serum reactions. This influence of relative proportions suggests an analogy with the precipitate which is formed when an electro-positive is mixed with an electro-negative colloid. In this case, if the proportions are optimal, both colloids are completely precipitated. If either constituent is present in relative excess precipitation is incomplete. Moreschi (1906) concluded as

the result of a series of experiments that precipitin and precipitinogen unite in variable proportion to form a series of precipitates. This result is at variance with the conclusions of Welsh and Chapman. The matter is one which merits further investigation.

If, then, antigen is mixed with antibody there follows an aggregation of particles, with the formation in all probability of an adsorption compound. This aggregation is an essential part of the mechanism of all the serum reactions, not merely of the precipitin reaction, but also of agglutination, lysis, complement fixation, and in all probability the opsonic reaction. If sufficient antiserum is used, and if the proportions of antigen and antibody are correctly adjusted, there is formed a bulky and flocculent precipitate. If the mixture contains a relative excess of either antigen or antibody the aggregation process is less complete. Here it may be mentioned that the ordinary method of performing the test in which a few cubic centimetres of the mixture are placed in an ordinary test-tube is not an ideal method of observing a finely divided precipitate. A mixture of antigen and antiserum which looks as clear as water in an ordinary test-tube may appear opalescent or even turbid if viewed through the length of a polarimeter tube.

THE RELATION BETWEEN THE FORMATION OF A PRECIPITATE AND THE FIXATION OF COMPLEMENT.

Complement fixation, which since the introduction of the Wassermann reaction has become comparatively familiar, was first observed by Bordet and Gengou in 1901. Interest in the subject was revived by Neisser and Sachs (1905), who elaborated a practical method for the identification of the blood of different kinds of animals. As to the explanation of the phenomenon considerable controversy has taken place. Gay (1905) came to the conclusion that the formation of a precipitate was the essential cause of the disappearance of complement. Neisser and Sachs, on the other hand, found that the amount of the precipitate and the amount of complement fixed stood in no direct proportions. They were able to observe marked fixation of complement in mixtures in which no precipitate could be recognised. They considered that the complement united with the complementophile group of an amboceptor, in strict accordance with the theories of Ehrlich. The view was accordingly propounded that precipitation and complement fixation were separate and independent phenomena. Muir and Martin (1906) found that the fixation of complement was, as a rule, closely associated with the formation of a precipitate, but were not convinced that precipitation formed a complete explanation of complement fixation. They cited as an instance a rabbit *v.* guinea-pig serum which produced, when mixed with its homologous antigen, a faint cloudiness but no definite precipitate. The capacity for fixing complement, however, was possessed by this serum to a very high degree. In other experiments they found that, if the antigen was greatly diluted, no precipitate was formed, but nevertheless the mixture was able to bind complement efficiently.

The case for the separate identity of precipitins and complement-binding antibodies rests on the following evidence. 1. Certain mixtures of antigen and antiserum in which a definite precipitate formed were shown to have little or no power to fix complement. 2. Mixtures containing very small quantities of either antigen or antiserum may appear perfectly clear and yet be shown to be very efficient for complement fixation. 3. Certain antisera give excellent results in complement-fixation experiments but yield very small precipitates. 4. If, during the process of immunisation, daily samples of serum are examined, complement fixation can as a rule be demonstrated at an earlier stage than precipitation. 5. If either the antiserum or the normal serum (antigen) be heated, the capacity for forming a precipitate may be lost, while the capacity for fixing complement may be retained. Bacterial extract kept for a time loses its power of forming a precipitate with homologous antiserum, but is still useful for the complement-fixation test. But, as will be seen from the following experiments, these difficulties can be explained without postulating the existence of two different kinds of antibody.

If a series of mixtures are prepared by adding various quantities of antigen to a constant quantity of a good antiserum, it is possible to compare the amount and state of division of the precipitate with the amount of complement fixed (Dean, 1911).

Scheme to Illustrate the Diagrams used in the Tables.

No hæmolysis ... ...
Trace ,, ...
Slight ,, ...
Half hæmolysed ... ...
Marked hæmolysis ... ...
Almost complete hæmolysis
Complete ,, ...

TABLE IV.

Dilutions of normal goat serum (antigen).	(A) 1 in 10 dilution of rabbit *v.* goat serum (antibody) amount of precipitate formed.	1 in 10 dilution of rabbit *v.* goat serum (antibody). (B) 0·05 c.c. guinea-pig complement.	(C) 0·1 c.c. guinea-pig complement.	(D) 0·2 c.c. guinea-pig complement.
(1) 1 in 10	90 c.mm.	■	■	■
(2) 1 in 20	60 ,,	■	■	■
(3) 1 in 40	40 ,,	□	◻	■
(4) 1 in 80	45 ,,	□	□	■
(5) 1 in 160	40 ,,	□	□	■
(6) 1 in 320	30 ,,	□	□	◻
(7) 1 in 640	10 ,,	□	□	■
(8) 1 in 1280	5 ,,	□	◻	■
(9) 1 in 2560	Large trace.	◻	■	■
(10) 1 in 5120	Trace.	■	■	■
(11) 1 in 10240	Nil.	■	■	■

Column A represents the results of the precipitation experiment. The tubes 1 to 11 in column A contained a bulk of 10 c.c., made up of 5 c.c. of the diluted goat serum (antigen) and 5 c.c. of a 1 in 10 dilution of rabbit *v.* goat serum (antibody). The lower portion of each of these tubes was narrow and calibrated. The tubes were incubated for 4 hours at 37° C., and the progress of the precipitation was observed and recorded at regular intervals. Immediately after mixing turbidity appeared in tubes 2 and 3. At the expiration of 10 minutes flocculi were apparent in tubes 2 and 3 and tubes 1, 4, and 5 showed uniform turbidity. After half an hour large flocculi which had formed in tubes 2, 3, and 4, had fallen to the bottom of the tubes and left a clear supernatant fluid. Flocculi had formed in tube 1, but had separated less completely. Small particles were visible in tube 5 and just visible in tube 6. In tubes 7 and 8 turbidity was present without visible particles. After one hour the first 6 tubes showed a deposit and a clear supernatant fluid. Tube 7 showed small particles suspended uniformly throughout its contents. In tubes 8, 9, and 10 a progressively diminishing opalescence was seen. After four hours all the tubes were centrifugalised and the actual amount of the deposited precipitate was read. The figures are recorded in column A.

The columns B, C, and D record the results obtained in a parallel complement-fixation experiment. To obtain a quantitative estimate of the amount of complement fixed 3 doses of guinea-pig serum were employed for each of the 11 mixtures of antigen and antibody.

It is evident from a consideration of Table IV. that the proportions of antigen and antibody which produce the largest quantity of precipitate are not those which effect the greatest fixation of complement. Similar results were obtained by mixing a variety of antigens with the homologous antisera. When antigen and antibody are mixed in the proportions most favourable to precipitation the aggregation process takes place energetically and large flocculi are rapidly separated. But if the mixture contains a relatively smaller amount of antigen, precipitation is slower and less complete. These are the conditions favourable to

TABLE V.

Precipitation Experiment.

3 c.c. extract of *B. typhosus* diluted.	+ 3 c.c. antityphoid serum (rabbit) diluted 1 in 20. + 3 c.c. of fresh guinea-pig serum diluted 1 in 5.	+ 3 c.c. of saline solution.	+ 3 c.c. saline solution + 3 c.c. guinea-pig serum diluted 1 in 5.
(1) 1 in 10	Flocculent precipitate—turbid fluid.	Slight turbidity.	Clear.
(2) 1 in 20	Large flocculent precipitate—clear fluid.	,,	,,
(3) 1 in 40	,, ,,	,,	,,
(4) 1 in 80	Flocculent precipitate—clear fluid.	,,	,,
(5) 1 in 160	Small particles—clear fluid.	Opalescent.	,,
(6) 1 in 320	Opalescent.	Clear.	,,
(7) 1 in 640	? Trace opalescence.	,,	,,
(8) 3 c.c. saline solution.	Clear.	,,	,,

Precipitation.—Result after 24 hours. The middle column shows the precipitation produced by mixing various quantities of typhoid extract with a constant quantity of antityphoid serum. The left-hand column shows the result obtained when fresh guinea-pig serum is added to these various mixtures of extract and serum. The third column shows that no precipitate is produced when normal guinea-pig serum is mixed with typhoid extract. Tube 8 in the left-hand column shows that no precipitate is produced by the mixture of the antityphoid serum with normal guinea-pig serum.

Complement-Fixation Experiment.

0·5 c.c. extract of *B. typhosus* diluted.	+0·5 c.c. antityphoid serum diluted 1 in 20. 0·5 c.c. complement 2 in 5.	0·5 c.c. complement 1 in 5.	0·5 c.c. complement 1 in 10.	Extract controls + 0·5 c.c. saline solution, 0·5 c.c. complement, 1 in 10.
(1) 1 in 10	◪	□	□	■
(2) 1 in 20	◪	□	□	■
(3) 1 in 40	◪	□	□	■
(4) 1 in 80	■	□	□	■
(5) 1 in 160	■	◪	□	■
(6) 1 in 320	■	■	◪	■
(7) 1 in 640	■	■	■	■
(8) 0·5 c.c. saline solution (serum control)	■	■	■	

Complement Fixation.—This experiment shows the amount of complement fixed by mixtures of typhoid extract and antiserum identical with those used in the precipitation experiments. The dilutions of extracts, antiserum and fresh guinea-pig serum (complement) were all used in a bulk of 0·5 c.c. After one hour's incubation each tube received 0·5 c.c. of a 1 in 20 suspension of sheep corpuscles and 0·5 c.c. of a 1 in 300 dilution of hæmolytic serum (rabbit *v.* sheep). The results were read after a second period of incubation lasting two hours.

complement fixation. Under these conditions the individual particles which form the precipitate are extremely small, but present in the aggregate an enormously larger surface area than the flocculi of a coarser precipitate. It seems probable that there is a direct relationship between the surface area of the particles of the precipitate and the amount of complement fixed.

By taking any one antigen and any one antiserum and by varying the relative proportions of these two ingredients it is possible to prepare mixtures which demonstrate either precipitation without complement fixation or complement fixation without visible precipitation. The amount of complement fixed is conditioned by two factors: (1) The amount of precipitate formed and (2) the rate of precipitate formation. Complement is fixed during the very earliest stages of the aggregation process which forms the precipitate. Indeed, after the process has advanced to a visible turbidity very little complement is taken up. The relative proportions of antigen and antibody which favour rapid and complete precipitation are positively unfavourable to complement fixation. If a constant amount of antiserum be taken it will be found, as a rule, that the quantity of antigen which will produce the best complement fixation is many times less than the amount necessary to produce the largest precipitate. The reason why the two reactions do not run a parallel course is not that they are caused by two different sets of antibodies, precipitins and amboceptors, but because they represent two phases or two stages of the same reaction, and it may not be possible to demonstrate both stages under the same conditions. A flocculent precipitate represents the complete and final stage of a change which can be recognised in its earliest and incomplete stage by means of the complement-fixation method. On the other hand, if the mixture contains a very small amount of the antigen the aggregation process is extremely slow and may never proceed to the point at which even opalescence is produced. Such a condition is, however, very favourable to complement fixation.

The conditions which we have considered are those in which a relatively small amount of antigen is allowed to interact with a relatively large amount of antiserum. In these cases, although no visible precipitate is formed, the early stages of aggregation afford exactly the physical conditions which favour complement fixation. We must now consider the conditions which obtain in mixtures containing very small amounts of antiserum, and in complement-fixation tests a good antiserum can always be used in a dilution of 1 in 100, often 1 in 500, or even 1 in 1000. If, however, a cubic centimetre of a 1 in 500 dilution of antiserum be mixed with an equal quantity of a suitable dilution of the homologous antigen, not even a trace of a precipitate can as a rule be detected, for such a mixture contains far too little of the precipitable protein of the antiserum. What is the mechanism of complement fixation under these conditions? In a series of experiments (Dean, 1912) it was shown that if, to a mixture of antigen and antiserum which fixes complement, but produces little or no precipitate, there be added fresh guinea-pig serum, a very definite and flocculent precipitate is produced, although a comparatively long time (up to 24 hours) may elapse before precipitation is complete. An example of such an experiment is given in Table V.

Table VI.

In this experiment tubes were used, the lower portions of which were narrow and calibrated in order that the amount of precipitate formed could be measured. Only one quantity of antigen was employed (3 c.c. of a 1 in 20 dilution of typhoid extract) and one quantity of the antiserum (3 c.c. of a 1 in 20 dilution of antityphoid serum). The amount of precipitate formed by the simple mixture of the antigen and antibody is shown in the second column, Tube 8. The actual bulk of the precipitate was 10 c.mm.

TABLE VI.—*To Illustrate Result obtained by adding Various Amounts of Fresh Guinea-pig Serum (Complement) to a Mixture of Typhoid Extract and Antityphoid Serum.*

	3 c.c. of guinea-pig serum.	+ 3 c.c. antityphoid serum 1 in 20.+ 3 c.c. typhoid extract 1 in 20. After 6 hours.	+ 3 c.c. antityphoid serum 1 in 20.+ 3 c.c. typhoid extract 1 in 20. After 24 hrs. c.d.*	+ 3 c.c. saline solution + 3 c.c. typhoid extract 1 in 20. After 24 hrs.	+ 3 c.c. antityphoid serum + 3 c.c. saline solution. After 24 hrs.	+ 6 c.c. saline solution. After 24 hrs.
1	Undiluted.	Large flocculi.	30 c.mm.	Clear.	Clear.	Clear.
	Diluted.					
2	1 in 2½	,, ,,	30 ,,	,,	,,	,,
3	1 in 5	,, ,,	20 ,,	,,	,,	,,
4	1 in 10	Small particles. Turbid.	10 ,,	,,	,,	,,
5	1 in 20	,,	10 ,,	,,	,,	,,
6	1 in 40	,,	10 ,,	,,	,,	,,
7	1 in 80	,,	10 ,,	,,	,,	,,
8	Control 3 c.c. s.s.†	,,	10 ,,	,,	,,	,,

* c.d. = Centrifugalised deposit. † s.s. = Saline solution.

All the tubes were incubated for 6 hours at 37° C. The tubes were then placed in a cool room at 8° C. After 24 hours the tubes in the first column were centrifugalised and the deposits observed. All the control tubes remained absolutely clear.

The table shows that the addition of guinea-pig serum to this mixture caused a very marked increase in the bulk of the precipitate. In the tubes containing the large quantities of guinea-pig serum the bulk of the precipitate was twice and three times as great as the precipitate produced in the simple mixture of antigen and antibody. It is difficult to escape the conclusion that the larger precipitates were partly derived from the proteids of the guinea-pig serum.

Similar results were obtained in a large series of experiments in which various antigen-antibody systems were employed. Normal horse and normal sheep serum were shown to be as effective as guinea-pig serum in adding to the bulk of the precipitate. Similar results were obtained if in place of the whole guinea-pig serum a solution of guinea-pig euglobulin was employed. These experiments led to the conclusion that the interaction of antigen and antibody may cause the precipitation of the globulin of a normal serum if such is added to the mixture. That this precipitation of the globulin of normal guinea-pig serum is an essential part of the mechanism of complement fixation can hardly be doubted. It will be remembered that if euglobulin is precipitated from fresh guinea-pig serum by distilled water or weak acid, the complement is split in two fractions, the so-called mid-piece and the end-piece. The mid-piece fraction is carried down with the precipitated euglobulin while the end-piece remains in solution (Ferrata, 1907; Brand, 1907; Liefmann, 1909; Sachs and Altmann, 1909). Moreover, in complement-fixation experiments the mid-piece is bound to a much greater extent than the end-piece (Stwirsky, 1910; Henderson Smith, 1910; Sachs and Bolkowska, 1910; Amako, 1910; and Gengou, 1911). It may, however, well be doubted if any such substance as the mid-piece fraction of the complement exists. The action of the so-called mid-piece may be entirely due to the physical state of the adsorbed particles of euglobulin.

It has already been mentioned that these precipitates, which occurred in mixtures of antigen, antibody, and complement, were often not formed until several hours had elapsed. The tubes were consequently often left overnight in the ice chest. This practice led to the observation that these precipitates are formed most readily at a low temperature and that, if after the precipitate has formed, the tubes are placed in an incubator at 37° C. the precipitate dissolves and the mixture becomes once more absolutely clear. On replacing the tubes in the ice chest the precipitate re-forms. The behaviour of this precipitate which forms at 0° C. and dissolves at 37° C. strengthens the belief that we are dealing with an adsorption process. At the lower temperature the adsorption of euglobulin by the minute particles of the precipitate is more complete. When the antigen is a cell or bacterium susceptible to lysis the result of this aggregation of the particles of euglobulin is the concentration of the lytic agent present in the complement (so-called end-piece) at the surface of the cell which is to be dissolved. For the subsequent and distinct reaction which causes the solution of the cell envelope a relatively high temperature (37° C.) is necessary or, at any rate, desirable. If the fixation of complement is dependent on an adsorption process we should expect that the reaction would take place with greater facility at a low rather than a high temperature.

TABLE VII.

0·5 c.c. extract of *B. typhosus*, diluted.	+ 0·5 c.c. antityphoid serum diluted 1 in 100. Complement 2 in 5. 0° C.	37° C.	Complement 1 in 5. 0° C.	37° C.	Complement 1 in 10. 0° C.	37° C.	+ 0·5 c.c. saline. Complement 1 in 10. 0° C.	37° C.
(1) 1 in 5	■	■	□	■	□	□	■	■
(2) 1 in 10	■	■	□	■	□	□	■	■
(3) 1 in 20	■	■	□	■	□	□	■	■
(4) 1 in 40	■	■	◪	■	□	◪	■	■
(5) 1 in 80	■	■	■	■	□	■	■	■
(6) 1 in 160	■	■	■	■	◪	■	■	■
(7) 1 in 320	■	■	■	■	■	■	■	■
(8) 0·5 c.c. saline.					■	■		

In the experiment reproduced in Table VII. duplicate sets of the bacterial extract, the antiserum, and the complement were prepared. Set A was warmed to 37° C. and Set B was cooled to 0° C. Antigen, antibody, and complement were then mixed in the proportions indicated in the table. Set A was then kept for half an hour at 37° C. and Set B for half an hour at 0° C. Both sets were then exposed to room temperature for one hour. Blood and hæmolytic serum were then added to each tube and all tubes were then incubated for two hours at 37° C. The results show a very marked difference between the two sets.

This experiment shows that in a mixture of typhoid extract and antityphoid serum far more complement is fixed at 0° C. than at 37° C. Similar results have been obtained with serum and homologous antiserum and with the Wassermann reaction.

Moreover, if an experiment be devised to show the rate at which the reaction occurs at the two temperatures it is possible to demonstrate that, although the reaction takes place more rapidly at 37° C., the actual amount of complement fixed is much greater at 0° C. This result is best explained on the assumption that complement fixation is a process of adsorption.

AGGLUTINATION.

The explanation of the agglutination reaction as an adsorption phenomenon has been the thesis of many contributions to the literature of immunity. Bordet (1899) considered that agglutinin is adsorbed by the bacilli as dye is adsorbed by filter paper. The aggregation of the bacilli is then brought about by changes in the molecular attraction between the bacilli and the surrounding medium. The question of agglutination was very thoroughly studied from the adsorption standpoint by Craw (1905). Craw showed that the rate of addition of bacillary suspensions to agglutinating serum is a factor determining the amount of agglutinin fixed by the bacilli. By adding a suspension of bacteria in parts to the antiserum Craw was able to show that more agglutinin was removed than is the case when the whole amount of bacillary suspension is added at once.

The process of agglutination is probably brought about by an interaction between the antiserum and antigen which has passed out from the bacillus into the medium which immediately surrounds it. The result of this interaction is the aggregation of the particles of the globulin of the antiserum on the surface of the bacillus. In other words, the proteins of the antiserum are adsorbed by the bacillus. For the production of agglutination the presence of precipitable protein is essential. If to a mixture of bacillary emulsion and diluted antiserum there be added a third ingredient, normal serum, the agglutination of the bacteria is rendered more complete. This reinforcement of the proteins of the antiserum by those of a normal serum has been called conglutination. This phenomenon was described independently in 1906 by Muir and Browning and by Bordet and Gay.

The substance present in normal serum which is able to aid the agglutination of red cells or bacteria by the homologous antiserum appears to be the euglobulin (Dean, 1911). The effect of adding various dilutions of euglobulin solution to mixtures containing sheep cells and various quantities of the homologous antiserum is seen in Table VIII.

TABLE VIII.

1 c.c. of dilution of hæmolytic serum, rabbit *v.* sheep.	+ 1 c.c. middle-piece solution diluted. 1-10	1-20	1-40	1-80	1-160	+ 1 c.c. normal saline.
1	1-10 ++++	++++	++++	++++	++++	++++
2	1-20 ++++	++++	++++	++++	++++	++++
3	1-40 ++++	++++	++++	++++	++++	++++
4	1-80 ++++	++++	++++	+++	+++	++
5	1-160 ++++	++++	++++	+++	+	+
6	1-320 ++++	++++	++	++	0	0
7	1-640 +++	++	+	0	0	0
8	1-1280 +++	+	0	0	0	0
9	1 c.c. normal saline. 0	0	0	0	0	0

Each tube contained a volume of 3 c.c. made up of 1 c.c. of a 1 in 20 suspension of washed red cells of the sheep, 1 c.c. of a dilution of heated hæmolytic serum (rabbit *v.* sheep), and 1 c.c. of the diluted middle-piece solution. The tubes numbered 9, in each row, contained no immune serum and the bulk was made up to 3 c.c. by the addition of 1 c.c. of normal saline solution. In these tubes no agglutination occurred, the middle-piece solution by itself being unable to agglutinate the red cells. The tubes in the last column contained 1 c.c. of the suspension of red cells, 1 c.c. of a

dilution of the hæmolytic serum, and 1 c.c. of normal saline solution. The agglutinative power of the immune body acting by itself is shown in this column. In the remaining columns is shown the effect of the combined action of the immune body and the middle-piece solution.

That in such a reaction the euglobulin is actually precipitated may be shown by an experiment similar to that shown in Table IX.

TABLE IX.

Tube.	Solution of laked corpuscles.	Antiserum, rabbit v. sheep cells, 1 in 200.	Normal saline solution.	Solution of middle-piece 1 in 10.	Normal saline solution.
	c.c.	c.c.	c.c.	c c.	c.c.
1	5	5	—	10	—
2	5	—	5	10	—
3	5	5	—	—	10
4	—	5	5	10	—

One cubic centimetre of thoroughly washed sheep corpuscles was laked with 9 c.c. of distilled water. The solution of corpuscles was made up to the usual saline content by the addition of 10 c.c. of 1·7 per cent. sodium chloride solution. After filtering many times through filter paper a perfectly clear solution was obtained, representing a 1 in 20 solution of red corpuscles in normal saline. The following mixtures were then prepared:—

In tube 1, 5 c.c. of the solution of corpuscles was added to 5 c.c. of the diluted antiserum. In the control tubes 2, 3, and 4 the ingredients indicated in the first three columns were mixed. The volume in each tube was then 10 c.c. All the tubes were allowed to remain for one hour at room temperature. They were then examined, and the contents were found to be absolutely clear. To tubes 1, 2, and 4 were then added 10 c.c. of the 1 in 10 middle-piece solution; to tube 3 was added 10 c.c. of normal saline solution. All four tubes were then incubated for four hours at 37° C. and then placed for 12 hours in a cool chamber at about 8° C. Tube 1 was then found to contain a small but definite white flocculent deposit. The three control tubes remained absolutely clear.

CONCLUSIONS.

In discussing the merits of rival theories of the mechanism of the serum reactions it has been frequently observed that Ehrlich's hypothesis alone provides an explanation of the problem of specificity. The value of the side-chain theory as an explanation of specificity may, however, be doubted. To say that antigen unites with antibody as a key fits a lock is no explanation at all. It is merely a diagrammatic representation of the supposed facts. Of the nature of the fundamental reaction between antigen and antibody we have, at the present time, no knowledge. But, in all the serum reactions which have been above considered, the immediate consequence is an aggregation of globulin particles around the antigen. The degree to which the aggregation or precipitation proceeds depends entirely on the experimental conditions, on the relative proportions of antigen and antibody in the mixture, on the nature of the antigen-containing substance, red corpuscle, bacillus, or normal serum, on the presence of some third factor, a normal serum containing complement or conglutinin. In other words, the various serum reactions are various methods of observing and measuring one single reaction. The simplest of these reactions is the precipitation reaction, for in it the formation of the precipitate is directly observed. In the other reactions the aggregation of particles may be less complete and the change is measured by indirect methods.

The main phenomena are most readily accounted for by Bordet's adsorption theory, and no useful purpose would seem to be served by postulating the existence of a separate kind of antibody for each of these reactions. The reactions are no doubt of a very complex nature, as all reactions which occur in a mixture of colloids must be, and it is to be anticipated that great difficulties must be encountered before any entirely satisfactory explanation is arrived at. Similar difficulties have been met with in the past, whenever the attempt has been made to explain physiological phenomena in the light of the laws of chemistry and physics. These difficulties will in time be met and with a more perfect knowledge of the mechanism of the serum reactions there will be attained a more perfect knowledge of the laws which govern both natural and acquired immunity.

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Continued at foot of next column.

Presidential Address
ON
THE STATE OCTOPUS AND THE MEDICAL PROFESSION.

Delivered at the Harveian Society of London on Jan. 11th, 1917.

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GENTLEMEN,—Year by year the State, like an octopus stretching out one or more of its tentacles, grasps and absorbs some portion of the rights, privileges, or emoluments of the medical profession or the public. I propose to indicate roughly, for time will not permit me to do so in great detail, the methods and progress of this absorption. I shall appreciate its value to the public, even if it is detrimental to our profession as a whole or to individual sections of it, for I hold the opinion that the public welfare is our highest aim and object. And I shall try to gauge its progress and suggest the best methods for watching and directing its course.

CHANGED RELATIONSHIP OF THE STATE, THE PUBLIC, AND THE MEDICAL PROFESSION.

Half a century ago there was little State interference with the medical profession, and few burdens, except registration, were laid upon it. At this remote period it was customary for the eminent lecturer who gave an opening address at a medical school to speak in grandiloquent language of the noble aims of our profession. It was generally insisted that the student must not enter on its pursuit for the sake of filthy lucre, that the good of the public was alone of importance, and that life should be lived on a basis of pure altruism, even if it did not provide substantial meals. Verily an opening address was a true eye-opener. The lecturer was usually a successful man who did not realise the needs of the common herd or had forgotten earlier impecunious days, though occasionally one was bold enough to recall the principle that the labourer is worthy of his hire, or else he spoke with his tongue in his cheek.

Even in those days the State exploited the services of the profession, for the medical attendant was compelled to give a death certificate without fee. And if he happened to be an officer of a public institution and an inquest were held on a patient who died therein, he had to give expert evidence when called on; he had to make a skilled post-mortem examination should the coroner order one; and he had to waste valuable time in the precincts of the court; and all this without fee or reward, receiving thanks rarely and ungracious criticism not infrequently. No wonder it is

Continued from preceding column.

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more satisfactory, as this exploitation of our youngest members still exists, that the patient should die on the steps of the hospital rather than across the threshold.

Under the Public Health Act of 1875 urban and rural sanitary districts were formed. Medical officers of health were appointed in charge of these districts. A diploma in public health was evolved in order to specialise this branch of service and supply evidence of the examinational qualifications of those applying for such posts. Since then the medical officer of health, though often underpaid, has developed into a being of imposing power and authority, under the ægis of the Local Government Board. In a sense he is the lily of the profession, for he toils not neither does he spin in the practice of medicine, unless he is in charge of an isolation hospital. He is no longer a medical man; he has sloughed his skin and unfortunately has become a departmental official, to whom the interests of the profession are only of minor importance.

Many of the burdens thrust upon our patient shoulders have arisen through the uncontrolled activities of these officers or at their instigation. Thus, we have to notify cases of infectious disease. Year by year more and more diseases are included in this category; perhaps at first only in some urban district and on the *ipse dixit* of a medical officer of health, who speaks to his local council with the dogmatic voice of a god, for he alone is assumed to have knowledge of the subject. For instance, notification of whooping-cough is insisted on in some districts in spite of the fact that there is no evidence of its value in reducing the spread of the disease, and that, generally speaking, it is not diagnosed among the poorer classes until the whoop is characteristic and the infectious stage almost over. Poliomyelitis has also been added to the list, although there is no evidence of its conveyance by direct infection. And in 1913–14 ophthalmia neonatorum was wisely added. Of course the main object of notification is to control the spread of the disease and isolate its source. It sometimes is beneficial in leading to efficient treatment. But I maintain that no disease should be made notifiable unless such a measure is approved by an authoritative body representative of our profession.

In 1907 the medical inspection of school children was authorised by Parliament and medical officers were appointed for this purpose. It was not a great step onward to the treatment of enlarged tonsils and adenoids and errors of refraction. This is partly carried out in hospitals and partly by general practitioners in semi-private clinics. Seeing that severe hæmorrhage is possible after operation, such clinics ought to be provided with an emergency bed. Possibly a further step will be the treatment of all ailments in school children at these clinics and the gradual evolution of numerous small centres of semi-hospital practice, which may or may not be to the advantage of the public and the profession. Bear in mind that the school doctor does not treat these patients at present. He measures and he weighs them, collecting masses of statistics. He examines them and recommends treatment. He, too, has become a departmental officer.

The Public Health (Tuberculosis) Regulations of 1912 have transferred the treatment of tuberculous patients in great measure to public officials with medical qualifications. These patients now come under the conjoint charge of the medical officer of health, the medical officer of the tuberculosis dispensary, and perhaps a sanatorium medical officer. It is possible that all cases, rich and poor, will eventually be brought under such control and that the treatment of patients with tuberculosis, especially of the lungs, will pass out of the hands of the general practitioners into those of departmental officers.

The Mental Deficiency Act of 1913, in operation since April 1st, 1914, has also affected our relations with the public and the State.

The National Insurance Act brings home to us the profound changes which are taking place in the relationship between the medical profession and the public, through the medium of the State and its various subordinate bodies, such as county and borough councils, municipal bodies, and boards of guardians.

"MENTALITIES."

Let me digress for a moment and, after the style of a virulent medical controversialist, make a few preliminary remarks on what are at present called "mentalities." Let me premise that "change" is not synonymous with "progress," though to some minds all change is progress. In actual life we meet with two distinct types of mentality, though the bulk of mankind occupy an intermediate position. One man goes baldheaded for change. He is an iconoclast. He destroys an existing institution because he sees evil in it, but he lacks the intelligence or the patience to think out logically the alternative scheme in his mind and the evils likely to develop in his new Utopia. The Insurance Act and other political measures are priceless illustrations of this character.

In golden visions a new land legislation was going to hand over that Castle in Spain, the latent wealth in our agricultural industry, to those unfortunate men, the failures in the towns. They were to go "back to the land" and earn vast sums from the cultivation of the ground in spite of their lack of training and education in one of the most difficult of trades, one which can only be learnt thoroughly by an intimate experience from childhood of all the processes of agriculture.

So, too, vast sums were to be drained into the Treasury by means of an increment duty. The result, as foretold by the opponents of this measure, has been a great pecuniary loss to the Treasury and a disadvantage to the poor, by reducing the provision of cottages and inducing a rise in rents. Rather than attempt to raise money and at the same time put a drag on the building industry, it would have been wiser and cheaper to spend five millions a year, one day's war expenditure, on the building of cottages and other dwellings for the wage-earning classes.

Usually the man of this type regards the medical profession as a "monopoly"—that blessed word which damns without explanation of its meaning. He little knows that the monopoly consists in the payment of fees to the State, for various degrees and a licence to practise, in return for an amount of protection which may be summed up in the power to sue for fees for services rendered. Neither the public nor the profession is protected against the evils of quacks and quack medicines. Anyone may practise our art in all its branches so long as he does not pretend he is a qualified medical practitioner, though he is liable to prosecution for manslaughter if his patient dies. And under the Apothecaries Act of 1815, Section xx., he is liable to a penalty (fine) if he practises as an apothecary. Of so little value is this State protection that probably any one of you would make a larger income out of our woolly-headed public by dropping your titles and diplomas and advertising a sure remedy for all the ailments of mankind. I would suggest a pill which acts mildly and efficiently, purging the vile body of all its ill humours and the afflatus which is not divine.

The other type of man is less adventurous in the doing of good or evil by interference with the ordinary routine of life. He does not set the world ablaze to advertise his own importance. He is devoid of the vanity which lies at the root of the desire to put the world to rights. He is more or less satisfied that all is for the best in the best of all possible worlds, and that it is better to endure the ills he knows than to stir up others which may be worse. Such a man becomes stereotyped in thought and action, in speech more dogmatic as his arteries harden, and somewhat intolerant of new ideas, even if of German origin. Steadily and satisfactorily he conducts the routine business of the little world in which he lives. Slowly and cautiously he tests, and perhaps adopts, new hypotheses and fresh methods of treatment. In the face of fresh ideas it is his habit to "wait and see." Yet, withal, he is tardily progressive, not wildly careering after the exploitation of some new system of treatment or synthetic drug, but patiently sifting and adding to the sum of knowledge.

Roughly, the difference between these two characteristic mentalities is like that between youth and age. Fortunately most of us occupy an intermediate position, neither wildly iconoclastic nor too rigidly stereotyped. Few seem to get beyond middle age in the realms of mind, until the final rapid subsidence into complete senility or retirement into the country and a vegetable existence. It is medical men of this intermediate type who are so badly needed on State and municipal committees. Were such an influence more in action we should not so frequently be up against some new thing, experimental in character rather than of proved value.

NEW SCHEMES.

I have already pointed out that many a scheme is evolved by the Local Government Board, or a subsidiary council, without obtaining the consultative opinion of any representative medical body, and often on the mere *ipse dixit* of

some local medical officer of health. Sometimes it is initiated by a self-appointed leader of the profession, who collects others like unto himself. We have had instances of this in the development of the crusade against tuberculosis. Occasionally these "leaders" are in opposition, as in the painful case of the manifesto published in favour of alcohol. But, however initiated, the scheme is set in action by an Order in Council or some local by-law, and we are expected to carry it out without murmur or protest.

As a rule these fresh burdens on the doctor are unaccompanied by fees for the extra work, or at most only nominal ones. For instance, the fee for notification of infectious disease used to be 2*s*. 6*d*. for a private and 1*s*. for a hospital case. It is not obvious why the extra work should be paid for at a lower rate when it is done by an underpaid doctor attached to a public institution. The profession has recently received its just reward for submitting to such an inequality in payment for identical work. Its insignificant fee of half-a-crown has been reduced to a shilling for private cases. I wonder that the shilling fee for hospital cases has not been halved. And this reduction has been enforced at a time when the doctors are doing an enormous amount of gratuitous work and the cost of living has greatly increased; and it was carried by Members of Parliament receiving £400 a year, of which £100 is free of income-tax, at a time when the services of most of them are of little value and their work in the House of Commons has much decreased.

THE INSURANCE ACT.

The Insurance Act is a great conception inadequately carried out. Instead of being used as a vote-catching measure, and including all employees, no matter their age and health, it should have been started on a smaller scale for the public benefit alone. It ought to have been limited at first to employees under 25 years of age, the healthiest class in the community. In the course of 40 years all the wage-earning classes up to the age of 65 years would have been insured. No doubt 40 years is too long for the politician, though but a moment in the life of a nation. I believe that the soundest policy would be to start a new scheme on these lines, independent of the present one, which would eventually lapse and be replaced by an efficient Act. In its present state the financial basis of the Act is less than doubtfully sound, its administration chaotic, its innumerable regulations almost impossible to understand, and the general result one of dissatisfaction. Practically it has resulted in a huge club system on a State basis, possessing all the evils of the old club system and none of its advantages to the members from a medical point of view, but financially profitable to the doctors and the clerical staff. As far as I can judge, the only advantage to the public is that every insured patient is entitled to demand treatment for the most trivial ailment, and a certificate enabling him to obtain sick benefit if unable to work, with the result that trivial ailments have become much more frequent and a desire of obtaining a paid holiday has led to their exaggeration.

From the public point of view I regard the medical section of the Act as a failure. It is not as good as the old club system with its admitted evils. Thousands of the insured are dissatisfied and avoid their panel doctors. Adequate treatment has not been secured—merely ordinary out-patient treatment, the patient being referred to a hospital for more serious ailments.

The Government has not carried out Mr. Lloyd George's promises. Absolute freedom as to choice of doctor is not in force; he must be on the panel. Still less is it possible to make a change when desired. Permission to make "own arrangements" outside the panel have been generally refused.

Panel doctors are practically State officials and their sympathy with the patients has diminished. There is more illness, more malingering and neurasthenia, greater prolongation of illness, and an increasing demand for certificates. Often a patient obtains a larger income when ill than when at work. Disease has to be treated more or less according to rules, and the cheaper drugs used for panel patients help to prolong illness.

Some complaints from panel patients are trivial and contemptible. The members of a society for agricultural labourers complain bitterly that the doctor now charges 5*s*. for examination of an applicant for membership, whereas in the old club the fee was only 2*s*. They refuse to pay it and the society is languishing for want of new members. It does not appear to have been pointed out to them that the weekly wage of the labourer has gone up more than 5*s*., that the doctor has also to face the increased cost of living, and that in the old club the doctor took a much more sympathetic interest, regarding it as partly a charity, whereas insurance is a State affair.

And I want to lay it down as an axiom, to be borne in mind by every member of our profession, that gratuitous expert services should not be rendered to the State or any rate-levying body. No such service is appreciated at its true value. It is not charitable service to the poor, and merely lightens to an infinitesimal extent the burden on tax- and rate-payers, many of whom are much better off than the exploited doctor.

Payments under the Act.

Under ordinary systems of insurance it is customary to pay a premium in advance to cover a definite liability, generally for a year. The Insurance Act tempers the wind to the shorn lamb, for the insured patient has to pay weekly premiums for six months before becoming entitled to benefit. By this means a big fund was formed of contributions from the employers, employees, and the State. It should have amounted to 13*s*. per female and 15*s* 2*d*. per male, apart from the State contribution. At the end of six months the work of the doctor began, and there does not seem any just reason why he should not have been paid 7*s*. per head at once for each patient accepted by him. Apparently the accumulated preliminary fund was devoted to payment for clerical work, a great burden on the finance of the Act—a veritable old man of the sea.

The Act fixed an annual capitation grant for medical treatment, and Mr. Lloyd George frequently stated it would be at least 7*s*., possibly more, as there was a lien on a floating sixpence. But agreements between the State and the profession are apparently only to be kept by the latter. In step the Insurance Commissioners, with powers above and not under the control of Parliament, and, subsequent to the signature of these agreements, regulations are issued which make the annual capitation fee a sum of no definite amount and not payable within certain limits of time. The panel doctor receives an unnamed sum, paid on uncertain dates, and "as soon as may be" after its receipt by the Commissioners.

The medical profession undertook the treatment of the insured for a minimum fee of 7*s*. per annum. For 1915 the payment was 5/7·96 per head. This is explained by the Commissioners as an equivalent payment, because some of the doctors' lists are inflated. It is a method for counteracting the errors due to inefficient book-keeping. It creates great injustice. A doctor with an uninflated list receives a grant deficient to the extent of 20 per cent. The Commissioners have also determined that their liability to the panel doctor ceases with the death of the patient, although the doctor undertook the contract for a year. If the insured person dies on the first day of the year the medical fund is only to get 1/365th part of 7*s*.; and this, in spite of the fact that the Commissioners have received payment for six months in advance. It does not appear that the State is carrying out its bargain fairly.

New Regulations for 1917.

Clause 3 deals with the provision of medical services by any public authority over and above those provided by panel doctors. It states, with dangerous vagueness, that under such circumstances the practitioner "shall ..... take such other steps as may be reasonably necessary in order that the patient may derive full advantage from the provision of such services." Obviously the Commissioners will decide what is "reasonable," and, as far as one can judge, they expect the doctor to provide particulars as to the past history, diagnosis, and treatment; take and send specimens for laboratory examination; and attend, if necessary, with the patient for consultation. No extra payment is suggested for this fresh burden, which may become excessive. And there is no safeguard against the extension of so-called "reasonable provisions." This regulation gives the Commissioners power to increase the duties of the panel doctors without compensation. It has been accepted at present for the treatment of venereal diseases, which are said to have increased very greatly and require more adequate methods of control. But it may be applied in many ways, if consultative advice is to be placed within the reach of panel patients,

giving the doctor much extra work and with no extra expense to the patient. Instead of reducing the annual capitation grant the tendency will be to increase the doctor's duties and obligations.

The Disabled Soldier and Sailor.

The disabled soldier and sailor have created another problem for the doctors and Commissioners. Weak-minded sentimentalists nobly say that the medical profession should shoulder the burden of looking after these heroes. But it is the State which should bear the burden, not an individual section of the community. Had the Government, with a little foresight and apparent generosity, paid into the insurance funds the full amounts due from them as employers, the full contributions of their employees and the State grant, they might have been justified in saying that, as the medical profession had received the insurance premiums for medical services during the war, they must undertake the subsequent liability. But an extra burden has fallen on the panel doctors during the war, for a huge number of healthy lives have been removed from insurance, and the relative proportion of illness among the remainder is naturally greater. It would be grossly unfair for these men to come back into insurance with an increased sickness liability and the burden of their treatment be thrown on the panel doctors without extra payment. Special financial arrangements should be made for the treatment of the disabled when they are discharged.

VENEREAL DISEASES.

The provision of treatment for these affections under the public authorities is a great step to more efficient control, limitation of their extension, and efficacious treatment. But it is another inroad into the old relationship between the public and the profession, if it is made obligatory. So far it is not compulsory and the supporters of the scheme have not ventured to "go the whole hog." If so, notification would be essential. The main argument against it is that it would lead to concealment of disease, to evasion of treatment, or to treatment by quacks. Surely the answer is the abolition of quacks and quack medicines, and the punishment by imprisonment of anyone, except a qualified practitioner, who undertakes the treatment.

Compulsory notification has been adopted for many infectious diseases, as well as for others in which the transmission of infection by personal contact has not yet been adequately proved. Why, then, shirk it in this case? Is it because the Government fear the loss of revenue from stamp duties on patent medicines, or the attacks of newspapers which receive large sums of money for advertisements and puffs of these wares? More probably it lies in the absence of social stigma in the present notifiable diseases. On the other hand, the moral effect of notification on the rising generation would be enormous. Few young men dread infection as much as they fear being "found out" by their parents. And the risk of evasion is minimised by the provision of free treatment, for, under the new scheme, it is available for rich and poor and under safeguards as to privacy. But the whole scheme is defective, firstly, because no really authoritative medical body expressed its opinion thereon; secondly, because it establishes a new class of specialist; and thirdly, because the safeguards as to privacy are likely to prove illusory.

THE OUTLOOK.

The united efforts of panel practice, of State and municipal treatment of tuberculosis, venereal and infectious diseases, the possible provision of ante-natal and post-natal clinics, and the existence of numerous departmental medical hybrids in the shape of medical officers of health, school doctors, Poor-law and asylum doctors, tend to the establishment of a State medical service. An additional influence will be the return from the war of a large number of medical men, with no experience of civil practice, who may lack the means or the inclination to enter on such a mode of livelihood, and who may have become enamoured of an annual stipend, fixed duties, liberal freedom, and the independence of character acquired in the treatment of those submitted to their tender care and unable to change their doctor. Many will be disposed to sink to the level of the salaried official. Meetings have already been held in France, at the instigation of certain politicians, for the discussion of such a public service.

It is probable that in time each panel doctor will be limited to a definite number of panel patients—say, two to three thousand. From this it will be only a small step, and perhaps it may be advocated by the doctor, that panel practice should be limited in area and that each such doctor shall have charge of all the insured patients in a limited district. Of course, this would abolish the promised free choice of doctor, but I fancy this privilege is not often obtained or of much value. The natural sequence will be the conversion of panel practice into one of whole-time appointments. And the insurance of dependents will make this more certain, as finance on present lines will be impossible. It is obvious also that if clinics and pathological laboratories are provided for venereal diseases, a similar demand will be made for panel patients with other ailments. And, indeed, it seems logical that, if the insurance scheme is to be worked adequately on its medical side, it must be extended to the provision of hospital treatment with all the advantages pertaining thereto. Our hospitals will have to be assisted by the State or out of the rates, or taken over by the State. I am strongly opposed to the idea of a State medical service, but I see no great objection to hospitals receiving such assistance. It may necessitate a certain amount of supervision or control, possibly through the occasional visit of an inspector or by a representative on the committee of management. The amount of assistance would have to be proportionate to the work done and the facilities provided. There is no justification for hospitals putting their resources, provided as a charity by voluntary subscribers, gratuitously at the disposal of a State or rate-paid medical service.

Naturally there would be a big increase in hospital expenditure. The visiting staff of London hospitals receives no payment, or merely a nominal one, and is perfectly satisfied to give its expert aid and much time in a charitable cause. But, although it is often assumed that we will continue to give gratuitous services in return for a few gracious words of praise and an occasional title of honour, more often than not granted to some one or other of the less deserving of the profession, I think it will soon be realised that it is not charity to give such services to the State.

Recently there has been a striking illustration of the manner in which the medical profession is exploited. Although the State is responsible for the health of its officers as well as the rank and file, and reserves to its representatives the decision as to the capacity and fitness of the individual, it has accepted through the Red Cross Society and rich civilians the gratuitous services of a large number of our profession for the treatment of these officers. And I desire to remark that the treatment of officers on these lines in private houses, more or less suitable, is not, and cannot be, as good as that of the rank and file in the numerous large and well-appointed hospitals at their disposal, with the best conveniences for examination and treatment. The lack of a resident medical officer, a pathological apparatus and X ray apparatus, not to mention other defects, is a grave drawback. It is marvellous that there has been no outcry against a system so unfair to our officers.

I think it will be admitted that when valuable aids to the diagnosis and treatment of illness of all descriptions are at the disposal of the present panel patients they will be extended for the benefit of their dependents. All those receiving a weekly wage, and (or) below the income-tax limit, will be included. Do you think that the lower middle-class will be content to see the bulk of the nation provided with the best possible medical treatment, for which *they* are mulcted in high rates and taxes, without demanding similar provision, on a better scale as to environment, at a higher annual insurance fee? Treatment in a private ward in a properly equipped hospital is obviously much superior to that of any nursing home or private house. Hospitals will have to be enlarged to provide special wards for this class. The nation will be divided into the insured and the non-insured. Possibly the large group of the insured will be treated by State official doctors and the remainder will still exert the right of free choice of doctor and payment for services rendered. The State official will be a superior type of Poor-law doctor.

A State medical service will not be economical, though perhaps less extravagant than the panel system. It is suitable for those under discipline, but we do not want the nation under the heel of medical drill-sergeants. No doubt

there has been immense improvement in the control and prevention of disease by the medical department of the Local Government Board. And a certain amount of valuable work has been carried out in laboratories in reference to the cause of particular diseases. School medical officers have done good work in securing efficient treatment for hundreds of children who would otherwise have been neglected. But, so far, I have not noticed much evidence of any advance in scientific medicine, though the extension of treatment has been great and beneficial. Nor have I observed much original work done by the present State medical service—namely, the Poor-law doctors.

Further encroachment on private practice will ensue from the extension of sanatorium benefit to dependents. Wild-cat schemes have been mooted. Recently it has been suggested that, as sanatorium treatment has not produced any marked effect on the prevalence of tuberculosis, it would be better to insist on the wholesale migration of the tuberculous from unhealthy surroundings to properly supervised dwellings in pure air. It certainly would be a wholesale migration. And yet many develop tuberculosis under such conditions, while others sometimes recover though living in a most unfavourable environment.

SUGGESTIONS.

I hope I have made it clear that our relations with the State and the public are in a state of flux, and that it is dependent on individual members of the profession to watch and direct the course of the current. Unfortunately we have no representative body which possesses the complete confidence of our profession or the power to enforce its resolutions. The British Medical Association diminished its rapidly increasing influence by allowing some members of its council to make use of it for political purposes in connexion with the Insurance Act. At first it was remarkably successful in organising the profession in opposition to the Bill on certain lines, but some of its members broke up the concordance by holding meetings in support of the Bill. Incidentally I may remark they remained members of the Association.

Still, it is possible for the British Medical Association, if managed with greater tact, more tolerantly, and for the benefit of the profession as a whole, rather than for the advancement or advertisement of sections or individuals, to obtain and retain a valuable advisory and directing hand in the future. As our only active representative body it should receive our support, even if we do not invariably agree with its policy in particular cases.

I am strongly of the opinion that it is of the utmost importance for medical men to take a greater part in local politics and act as representatives on county councils and other local bodies. The selection of candidates for such posts should be made by the various branches of the British Medical Association, or at a joint meeting of members and non-members. But it must be borne in mind that such candidates must have no political axe to grind, and that the welfare of the public and the profession is their sole object. We do not want a repetition of the scandals in connexion with the appointments at the time the Insurance Act was in the throes of labour. Nor do we want representatives who have retired from practice through age, incompetence, or infirmity, for such posts are not those of *otium cum dignitate*. Granting efficacious leadership, it will be possible to develop a medical service, suitable to the genius of the nation, out of the present state of chaos which I have somewhat inadequately pictured. Above all, under proper leadership, it will be possible to put forward practical schemes, carefully thought out under medical guidance, rather than have to carry out the imperfectly devised experiments to which we and the public are subjected.

THE LATE W. A. LAUDER SMITH, M.A., M.B., B.C. CANTAB.—Dr. Lauder Smith died recently at his residence, Wells, Somerset, from pneumonia following influenza, in his fifty-second year. The deceased was highly esteemed in Wells, where he had several public appointments. The chairman of the Wells board of guardians, in alluding to the loss the board had sustained by the death of their district medical officer, said: "Dr. Smith had lived a beautiful life of self-sacrifice, and had literally worn himself out for others."

CASES OF CEREBRO-SPINAL FEVER IN THE ROYAL NAVY—AUGUST 1ST, 1915, TO JULY 31ST, 1916.

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(1) *Incidence of the Cases.*

DURING the year August 1st, 1915, to July 31st, 1916, there were 104 cases of cerebro-spinal fever in the Royal Navy, as compared with 170 cases during the first year of the war. This fall in the number of cases must be correlated with the contemporaneous fall in the incidence of the disease both in the civil population and also in the Army in this country.[1] Although the fall in the general incidence of the disease is probably the main factor in the smaller incidence in the Navy, it should be borne in mind that great care has been taken in prophylaxis, and that in the first half of 1916 bacteriological examination of swabs from the throats of new entries was made at Haslar, Chatham, Plymouth, and at Greenwich of non-contacts (new entries and drafts for sea) in order to detect "carriers." Out of 10,852 ratings examined 298, or 2·7 per cent., carriers were thus detected and isolated. Not only has the incidence been smaller, but it has been less widespread, for no case occurred at Blandford Camp or in the Akbar Establishment, in both of which there were a few cases during the first year of the war. At the Deal depôt, which was responsible for 25 cases during the first year of the war, there were 2 cases only in the second year. No case has occurred during the war at either Osborne or Dartmouth Royal Naval Colleges.

The cases occurred in the Plymouth district (23), Portsmouth district (27), Chatham district (18), at Shotley (11), at the Crystal Palace depôt (8), at Deal (2), and 10 cases on sea-going ships. During the first two years of the war out of 274 cases of cerebro-spinal fever in the Navy there were 22, or 8 per cent., with 13 deaths in sea-going ships. In one ship only was there more than one case (2).

The monthly incidence, with the results, is shown below. As in the first year of the war, the largest number of cases and of deaths occurred in February.

		Cases.	Deaths.	Recoveries.
1915.	August	4	2 or 50·0 p.c.	2
	September	4	3 .. 75·0 ..	1
	October	3	1 .. 33·3 ..	2
	November	6	5 .. 83·0 ..	1
	December	8	4 .. 50·0 ..	4
1916.	January	8	3 .. 37·5 ..	5
	February	26	7 .. 26·9 ..	19
	March	20	6 .. 30·0 ..	14
	April	7	2 .. 28·5 ..	5
	May	7	0 —	7
	June	3	2 .. 66·7 ..	1
	July	8	2 .. 25·0 ..	6
		104	37	67

Age incidence.—Among the 104 cases in the Navy 70, or 67·3 per cent., were under 20 years of age (83, or 79·8 per cent., being under the age of 25 years), and the number of cases progressively diminished in the succeeding decades. The percentage of deaths was lower under 20 years than in any of the succeeding decades. The average age of the 104 cases was 20·4 years, of the fatal cases 22·2, and of the recoveries 19·4 years. The extremes of age were 15 and 46 years.

Age periods.	Number of cases and percentage of the total 104 cases.	Deaths and percentage in the age periods.
15 to 19	70 or 67·3 p.c.	20 or 28·5 p.c.
20 .. 29	24 .. 23·1 ..	12 .. 50·0 ..
30 .. 39	6 .. 5·8 ..	2 .. 34·4 ..
40 .. 49	4* .. 3·8 ..	3 .. 75·0 ..
	104	37

* The case which recovered was invalided, and died suddenly six months later, the coroner's inquest finding pneumonia as the cause of death.

[1] For this information I am indebted to Surgeon-Colonel R. J. Reece, H.A.C.

In the first year of the war 60·6 per cent. of the cases were under 20 years of age.

Mortality.—Out of the 104 cases 37, or 35·6 per cent., proved fatal; this contrasts favourably with the mortality of 90, or 52·9 per cent., among the 170 cases during the first year of the war.

Ranks and ratings.—There were two officers—a midshipman Royal Naval Reserve (aged 18), and a surgeon probationer (aged 21), who both recovered. The 102 ratings were as follows: Boys (seamen class) 39 (7 deaths); seamen 22 (11 deaths); stokers 13 (6 deaths); marines 11 (3 deaths); engine-room artificers 5 (2 deaths); officers' stewards 3 (all fatal, average age 20 years); carpenter's crew 2 (1 death); boy servants 2 (1 death); cook's mate 1 (recovery); plumber's mate 1 (recovery); armourer's crew wireman 1 (fatal); trimmer 1 (recovery); boy artificer 1 (fatal).

(2) *Remarks on Some Clinical Aspects.*

Onset.—The mode of onset sometimes varied from the common form characterised by fever, malaise, headache, and vomiting. Eight patients when first discovered were in an unconscious condition, and 3 of these had fallen out of their hammocks; one of these, with a graze on the forehead, blood about the nostrils, and vomiting, was regarded for some days as a case of fractured base. Of the 8 cases with this apoplectiform onset, 4 proved fatal. In 4 cases in February respiratory symptoms were so well marked as to suggest pneumonia or acute bronchitis. In 1 case the prominence of abdominal symptoms gave rise to an initial diagnosis of appendicitis.

In 11 cases at least the disease began very shortly (within three days) after going on leave (6 cases) or returning from leave (5 cases), and in some instances considerable fatigue must have been entailed by the length of the journeys. In one instance the disease appeared three days after arriving on leave at Gosport from the Grand Fleet. In the 5 cases in which the disease appeared shortly after returning from leave, the question of infection when on leave arises. In 13 cases the disease occurred within three weeks of joining the Service and exposure to the trials incident to this change of life. In 3 cases the disease followed the onset of measles after an interval of about ten days. As these cases were already under observation in hospital, it is improbable that the initial mottled rash of cerebro-spinal fever was regarded as measles. In two other cases the disease attacked patients already in hospital, for a lacerated finger and pleurisy respectively. In 5 cases (4 fatal) meningitis, in which the cerebro-spinal fluid was proved bacteriologically to contain meningococci, supervened on otitis. In isolated instances drunkenness and head injury (1 case), influenza, and vaccination (4 cases) immediately preceded the onset. In 1 case pneumonia and cerebro-spinal fever co-existed. These various factors may have so reduced the bodily resistance as to enable saprophytic meningococci in the naso-pharynx to invade the system.

Rashes were recorded in 51, or 49 per cent., out of the 104 cases; in 41 cases the rash was petechial or hæmorrhagic, and 15, or 36·6 per cent., of these proved fatal, a mortality percentage very little higher than that (35·6) of all the 104 cases. In 1 case with a petechial eruption hæmorrhagic bullæ appeared on the ankles four days after the rash. In 5 cases there was a macular rash with 1 death, and in 5 cases a rose rash with 1 death. The mortality of the 51 cases with rashes was, therefore, 17, or 33·3 per cent.—namely, slightly lower than the mortality of the total 104 cases. In the first year of the war, rashes occurred in 102, or 62·6 per cent., of 163 cases, and the mortality of the cases with rashes was 52 (51 per cent.), or a little lower than that (52·9) of the total 170 cases. Although a very profuse hæmorrhagic rash is extremely ominous, the occurrence of a rash is not necessarily of grave significance. The rash was nearly always noticed on the first or second day of the disease.

Herpes was noted in 21, or 20·2 per cent., of the 104 cases; in 20 cases the herpes was on the lips; in the remaining case it was in the distribution of the nasal branch of the ophthalmic division of the fifth nerve, but the cornea was not affected. In one of the cases with labial herpes there was also cervical herpes. In 14 cases there was also an initial rash; in 2 cases the rash and the labial herpes both occurred on the second day of the disease; in the remaining cases the herpes appeared later than the rash, on an average on the fourth day of the disease, the extremes being the second and the eighth days. In some instances the labial herpes was very profuse. Of the 21 cases 4, or 19 per cent., proved fatal; this mortality is rather more than half that (35·6 per cent.) of the total 104 cases, and thus agrees with the ancient belief that herpes in cerebro-spinal fever, as in pneumonia, is a good prognostic. In the previous year herpes labialis was noted in 35, or 21·5 per cent., of 163 cases—almost exactly the same proportion as in the present series.

Rarer manifestations and complications.—Ocular symptoms. Photophobia, which has been stated to be rare,[2] was noted in 10 cases; conjunctivitis in 5, conjunctival hæmorrhage in 2, panophthalmitis with loss of an eye in 2, strabismus in 8 (5 fatal); ptosis in 3 (2 fatal); nystagmus on the second day in 1 (fatal), and von Gräfe's sign in 1. Hemiplegia occurred in 1 case and weakness of the arm in another case, both of these were fatal; facial paralysis in 1 (fatal), dysarthria in 1 (recovery), and dysphagia in 1 (recovery). Delirium tremens occurred in 2 cases (1 fatal). Pericarditis was noted in 2 cases, both of which recovered. Recent endocarditis was found after death in 1 case (*vide infra*), and transient systolic murmurs were heard in 4 cases which recovered. Status lymphaticus was found after death in 1 case. Hæmaturia due to hæmorrhagic cystitis and pyelitis was seen in 1 case, and 1 patient had polyuria for a few days, passing 8, 6, and 4 pints of urine daily, while the temperature was about 103° F. Epididymitis without any evidence of gonorrhœa occurred once.

Synovitis was noted in 4 cases (2 fatal) on the second, fifth, fifth, and sixth days of the disease; in 2 cases the knee was affected, in 1 the ankles and wrists, and in 1 the interphalangeal joint of a finger. All the cases had a petechial or hæmorrhagic eruption; this fits in with the view that when purpura and synovitis are associated, the latter is due to hæmorrhages into the synovial membrane. In the case with arthritis of the wrists and ankles on the fifth day of the disease, pericarditis with synovitis of the wrists, ankles, and knees developed on the ninth day; in spite of delirium tremens recovery followed. In the first year of the war there were 8 cases (2 fatal) of arthritis. Acute otitis supervened in 2 cases, both of which recovered.

Relapses during treatment are said not to be uncommon and generally to occur in cases of chronic hydrocephalus which terminate fatally. There was one case proved to be of this nature in a man, aged 19, the relapse which started after nine days of convalescence being ushered in by a rigor. In one case a true relapse or brief second attack occurred seven weeks after the temperature had been normal, and was followed by recovery (*vide infra*).

Mixed infections of the cerebro-spinal fluid were reported in 3 cases; pneumococci in 1 case without any obvious focus; and streptococci in 2 cases (one an otitic case, in the other infection occurred through the lumbar puncture).

Diagnosis.—Only those cases in which meningococci were found in the cerebro-spinal fluid have been accepted as cerebro-spinal fever. This criterion has very probably led to the rejection of some genuine cases of cerebro-spinal fever. But no clinical manifestation is pathognomonic of the disease. Thus a hæmorrhagic rash, though highly suggestive, was present in cases proved bacteriologically to be due to other infections, such as pneumococci, or to be free from micro-organisms. The latter group of cases, though unsatisfactory, must be recognised.[3]

A fulminating case of meningitis with a profuse hæmorrhagic rash occurred on Nov. 7th, 1915, in a cadet at Dartmouth. Bacteriological examination of the cerebro-spinal fluid, which was almost clear and contained a few red blood cells and occasional polymorphonuclear leucocytes, by Fleet-Surgeon H. C. Whiteside, R.N., failed to show any micro-organisms, the cultures were sterile, and no carriers were detected among 30 contacts. There was no necropsy. A brother died in infancy from meningitis believed to be tuberculous.

Cases with meningeal symptoms, which showed meningococci in the naso-pharynx but not in the cerebro-spinal fluid have been ruled out, as they may have been meningococcic carriers with meningism due to some other cause. In

[2] Foster and Gaskell. Cerebro-spinal Fever, p. 37. 1916: Cambridge.

[3] Among 121 cerebro-spinal fluids from cases of meningitis in the French Army Sacquépée, Burnet, and Weissenbach (Bull. Acad. de Méd., Par., 1915, lxxiv., 103–105) found 6 with the features of Widal's "puriform aseptic meningitis" in which no micro-organisms could be found by direct examination or cultivation.

this connexion it may be pointed out that during the acute stage of cerebro-spinal fever swabs from the naso-pharynx are often negative. Out of 33 cases of bacteriologically proved cerebro-spinal fever meningococci were found in the naso-pharynx in 7, or 21·3 per cent., only. This corresponds with von Lingelsheim's figures of 635 cases of cerebro-spinal fever with 146, or 22 per cent., positive cultivations from the naso-pharynx.[4]

Cerebral symptoms (meningism) accompanying acute infections, such as influenza, pneumonia, enteric, otitis, malaria, may closely imitate cerebro-spinal fever, and a certain diagnosis can be made only by lumbar puncture and examination of the cerebro-spinal fluid. Even if a patient has signs of pneumonia it is possible, as shown by isolated cases in both the recent epidemics in the Navy, that there is meningococcic meningitis as well.

From other forms of meningitis lumbar puncture and examination of the cerebro-spinal fluid constitute again the most reliable method of diagnosis. Even with pre-existing otitis it does not necessarily follow that meningococcic meningitis can be excluded; for, as mentioned above, in 5 cases (4 fatal) meningitis, in which the cerebro-spinal fluid was proved bacteriologically to contain meningococci, supervened on otitis.

Difficulty might arise in the diagnosis from the meningitic form of acute poliomyelitis in which all the symptoms of meningitis may be present, but "on lumbar puncture the cerebro-spinal fluid escapes under pressure, is clear, and on cytological examination may be found to contain an increased number of lymphocytes with a normal or sometimes a diminished sugar reaction and an increased amount of albumin" (Batten[5]). An outbreak in Devonshire and Cornwall in 1911 of what was at first thought to be cerebro-spinal fever was shown by R. J. Reece[6] to be one of acute poliomyelitis, and not one of acute poliomyelitis occurring concurrently with cerebro-spinal fever. In July, 1916, there was at Shotley an outbreak of 15 cases with the clinical symptoms of cerebro-spinal fever,[7] but 4 only were proved to be of this nature. Among the remaining 11 cases there was one only which could possibly be regarded as an example of the meningitic form of acute poliomyelitis.

In acute osteomyelitis of the spine lumbar puncture may give exit to pus from the extradural space. This occurred in 2 cases in the Royal Navy which will subsequently be published. In neither of these were there definite symptoms of cerebro-spinal fever, but Grisel[8] in a review of this form of osteomyelitis states that although in some cases the symptoms of compression are quite definite and disappear when the abscess is evacuated, there are others in which the association with meningitic symptoms and septicæmia renders the diagnosis very difficult.

The sequence of events in the two following cases is, perhaps, worthy of brief mention.

Two brothers from the Fair Isle, Shetland, had measles in September, 1915, in Haslar. One developed cerebro-spinal fever 13 days after the onset of measles and died. The other, who had never been well since the attack of measles, died in Haslar three months later from tuberculous meningitis. In both cases a post-mortem examination was made.

(3) *Summary of the Results of Treatment.*

Two out of the 104 cases were discovered after death only and, therefore, were not treated for the disease; 1 case (fatal) received soamin only; and 6 cases, of which 4, or 66·7 per cent., proved fatal, had lumbar puncture only. Therefore, out of 9 cases which did not receive serum 7, or 77·8 per cent., proved fatal.

Among the 95 cases treated by some form of serum the mortality was 30, or 31·6 per cent. This result, which is in striking contrast to the results of serum treatment in the first year of the war—105 cases with a mortality of 64, or 61 per cent.—fully justifies the serum treatment of the disease, and is compatible with the widely expressed view that the serums employed in this country during the first year of the war were largely deficient in antibodies. Flexner's serum, made under his direction at the Rockefeller Institute, New York, was not available during the first year of the war, but after the failure in this country of anti-meningococcic serum in the epidemic of 1915 the Rockefeller Institute reverted to the manufacture of the serum, and most generously placed a supply of a multivalent serum, made from 32 strains, at the disposal of the Royal Navy.[9] Other serums employed during this year, and not in the previous year, are Colonel Mervyn Gordon's various serums and the Pasteur Institute's multivalent serum. In the early part of the second year of the war, when the new serums were not available, Mulford's serum was given in a number of the cases, and throughout the year use was also made of the Lister Institute serum and of Burroughs Wellcome and Co.'s serum.

Of the 95 treated with intrathecal injections of serum, 60 did not receive any other form of specific treatment, and had a mortality of 18, or 30 per cent., which is a little lower than that (31·6) of the 95 cases. The remaining 35 cases received in addition one or more of the following forms of treatment: hypodermic or intramuscular injection of the serum, of vaccines or of soamin, or hexamine by the mouth, with a mortality of 12, or 34·3 per cent. In 23 out of the 35 cases the additional treatment was the simultaneous subcutaneous (or in a few instances intramuscular) injection of serum; this method was mainly adopted at Plymouth and Haslar; the mortality was 7, or 30·4 per cent. Vaccines were given in 8 cases, but did not appear, except perhaps in one or two instances, to exert any decided beneficial effect. The exact figures of the results of treatment are shown in the tabular form below:—

Tabular Summary of Treatment.

—	Cases	Deaths.	Recoveries.
		Per cent.	Per cent.
Antimeningococcic serum—			
Intrathecally	95	30 or 31·6	65 or 68·4
Alone...	60	18 ,, 30	42 ,, 70
Combined with serum hypodermically, vaccines, soamin, or hexamine	35	12 ,, 34·3	23 ,, 65·7
Combined with serum hypodermically	23	7 ,, 30·4	16 ,, 69·6
Combined with vaccine	4	3 ,, 75	1 ,, 25
Combined with vaccine, soamin, and hexamine	1	—	1
Combined with vaccine and hexamine	3	1	2
Combined with soamin	2	1	1
Combined with hexamine	2	—	2
Vaccines—			
(Never alone, always with intrathecal injection of serum) *vide* above	8	4	4
Hexamine—			
Alone...	1	1	—
Combined with intrathecal njections of serum, &c., *vide* above ...	6	1	5
Soamin—			
Alone...	1	1	—
Combined with intrathecal injections of serum, &c., *vide* above ...	3	1	2
Lumbar puncture (only)	6	4 ,, 66·7	2 ,, 33·3
Symptomatic treatment (only)	2	2	—

More than three-quarters of the 95 cases received serum within the first three days of the disease. From tabulation of 1211 cases Flexner found that when the serum was given within the first three days the mortality rate was 18 per cent., when between the fourth and seventh days 27·3 per cent., and when later than the seventh day 36·5 per cent., and therefore laid stress on the importance of early injection. In the 95 cases treated with serum in the Royal Navy this influence of time can also be seen:—

	Cases.	Deaths.	Recoveries.
1st to 3rd day	74	22 or 29·7 p.c.	52 or 70·3 p.c.
4th to 7th day	15	5 ,, 33·8 ,, ...	10 ,, 66·7 ,,
Later than the 7th ...	6	3 ,, 50 ,, ...	3 ,, 50 ,,
	95	30 ,, 31·6 ,,	65 ,, 68·4 ,,

[4] Quoted in the Report of the Special Advisory Committee upon Bacteriological Studies of Cerebro-spinal Fever during the Epidemic of 1915, p. 30.

[5] Batten, F. E.: Acute Poliomyelitis, p. 68, 1916. John Bale, Sons, and Danielsson, London.

[6] Reece, R. J.: Report of the Medical Officer of the Local Government Board, 1911–12. Appendix A, No. 4, p. 54. 1913.

[7] Fleet-Surgeon T. D. Halahan has recently published (THE LANCET, 1916, ii, 1102) the details of these and some additional cases and urges that they were cerebro-spinal fever.

[8] Grisel, P.: Rev. d'Orthop., Paris. 1911. 3 sér., II., 145. I am indebted to Temporary Surgeon L. Pearce Gould, M.D., F.R.C.S., R.N., for this reference.

[9] Vide Amoss and Wollstein: A Method for the Rapid Preparation of Anti-meningitis Serum, Journ. Exper. Med., N.Y., 1916, xxiii., 405.

The results obtained by the use of the various brands of serum are shown below in a tabular statement. Flexner's serum was employed in 39 cases altogether, with a mortality of 9, or 23 per cent.; in 27 of the 39 cases it was the only serum used, with a mortality of 6, or 22 per cent.; the 12 other cases in which other serums were given as well showed a mortality of 3, or 25 per cent. The other serums were given in much fewer cases. The mortality percentage of the 14 cases that received Burroughs Wellcome and Co.'s brand (alone or combined with other serums) was slightly lower than that of the cases treated with Flexner's serum; and the 16 cases treated by Gordon's various serums alone showed an even lower mortality,

Table showing Results of Treatment by Different Serums.

—	Cases	Deaths.	Recoveries.
		Per cent.	Per cent.
Flexner's serum alone	27	6 or 22·3	21 or 77·7
Combined with other serums	12	3 ,, 25	9 ,, 75
	39	9 or 23	30 or 77
Gordon's serums alone	16	3 or 18·7	13 or 81·3
Combined with other serums	6	3 ,, 50	3 ,, 50
	22	6 or 27·3	16 or 72·7
Pasteur Institute's multivalent serum (3619) alone	9	4 or 44·5	5 or 55·5
Combined with other serums	5	1 ,, 20	4 ,, 80
	14	5 or 35·7	9 or 64·3
Burroughs Wellcome & Co.'s serum alone	6	2 or 33·3	4 or 66·7
Combined with other serums	8	1 ,, 12·5	7 ,, 87·5
	14	3 or 21·4	11 or 78·5
Mulford's serum alone	10	5 or 50	5 or 50
Combined with other serums	2	1	1
	12	6	6
Lister Institute's multivalent serum alone	11	6 or 54·5	5 or 45·5

The number of occasions on which serum was given intrathecally varied in the 95 cases from 1 to 8, according to the duration of the symptoms. In some instances the improvement and fall of temperature after the injection of serum were dramatic.

Sixteen cases received one dose only, and 7 proved fatal, 6 being very acute or fulminating cases; 25 received two doses of serum (8 deaths); 22 cases three doses (7 deaths); 8 cases four doses (1 death); 11 cases five doses (4 deaths); 5 cases six doses (2 deaths); 4 cases seven doses (1 death); and 4 cases eight doses (no death). In many cases lumbar puncture was performed more often than serum was injected; in 1 chronic case in which serum was given six times, lumbar puncture was performed on 20 occasions.

Serum rashes, erythematous or urticarial, were mentioned in 22, or 23 per cent., of the 95 cases treated by serum, but may have been more frequent. The rashes and articular manifestations were practically confined to cases treated with Flexner's and Burroughs Wellcome and Co.'s brands.

Out of the 22 cases 21 received either Flexner's or Burroughs Wellcome and Co.'s serum; 12 had Flexner's serum alone, 2 Flexner's and Gordon's serum, 1 Flexner's and the Pasteur Institute's multivalent serums, 2 Burroughs Wellcome and Co.'s serum alone, 1 Burroughs Wellcome and Co.'s and Gordon's serums, and 3 Flexner's and Burroughs Wellcome and Co.'s serum (only 4 cases had this combination). The remaining case had 70 c.c. of Gordon's serum, and did not have any manifestations of serum disease except the rash. Out of the 95 cases treated with serum, 41 had Flexner's or Burroughs Wellcome and Co.'s serum, and among them rashes occurred in 21, or 51 per cent.; whereas among the remaining 54 cases treated by serum there was a rash in one case only. Six of the 22 cases with rashes also had serum hypodermically. The average amount of serum received by the cases with rashes was 65 c.c.; and the average amount received by 14 other cases which had Flexner's or Burroughs Wellcome and Co.'s serum and recovered was 70 c.c., or practically the same.

On an average the rash appeared ten days after the first injection of serum. In a case at Haslar which received one injection of 20 c.c. of Flexner's serum in a relapse seven weeks after the primary attack in Egypt, there was within a few hours an "immediate" serum rash. The patient stated that nine lumbar punctures had been performed in the primary attack, but there is no official information as to the administration of serum.

Of the 22 cases none proved fatal, but as the serum rash occurs after an interval of about ten days, the fulminating and acute cases are obviously excluded, and this observation has no prognostic value. Six cases had both herpes and a serum rash; 9 cases an initial rash and a serum rash; and 3 cases an initial rash, herpes and a serum rash (in one case on two occasions); presumably in these instances the skin was especially prone to react.

In some cases pains in the joints without effusion accompanied the serum rash, and in two instances effusion into the joints and a temperature of 102° coincided with the rash. In 2 cases at Chatham temporary deafness occurred at the same time as a serum rash and arthralgia, and was regarded by Temporary Surgeon A. C. McAllister as a manifestation of serum disease.

Grave accidents due to intrathecal injection of anti-meningococcic serum were very rare.

In one case lumbar puncture was done directly after admission to the Royal Naval Hospital, Plymouth, and 50 c.c. of turbid fluid containing meningococci spurted out; 15 c.c. of Gordon's multivalent serum was given intrathecally and the same quantity hypodermically. Respiration stopped at once. The necropsy showed fibrinous adhesions and purulent streaks over the cerebral sulci, with but little exudation at the base of the brain. Both lateral ventricles were distended with blood-stained serum. The purulent exudate over the hemispheres suggested that the illness had last a week. In another case at Plymouth lumbar puncture on the third day of the disease gave exit to 30 c.c. of turbid fluid, and 15 c.c. of Gordon's multivalent serum were injected intrathecally; five hours later respiration stopped before the pulse. The necropsy showed fibrino-purulent exudate over the base of the brain and much yellowish fibrin over the pons and medulla, turbid and blood-stained fluid in both ventricles, œdema of the cerebellum pressing on the pons, dilatation of the right side of the heart, and recent and old endocarditis of the mitral valve. Although death did not occur until five hours after the injection of serum, this case resembles the first in the presence of blood-stained fluid in the lateral ventricles of the brain. In a third case death occurred suddenly seven hours after injection of serum and the necropsy showed distension of the lateral ventricles and acute congestion and œdema of the cerebellum pressing on the pons.

In a man who had had six lumbar punctures the site of the punctures became inflamed and death rapidly followed; at the necropsy it was found that the lateral ventricles were greatly distended with pus swarming with streptococci.

In 2 cases lumbar puncture gave rise repeatedly to severe headache, which was partially relieved when serum was injected intrathecally.

FOUR CASES OF HEMIPLEGIA CAUSED BY EMBOLISM FOLLOWING GUNSHOT WOUNDS OF THE CAROTID ARTERIES.

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A SERIES of 14 cases has recently been reported by Sir George Makins[1] in which symptoms of cerebral embolism followed gunshot injury of the carotid arteries. Of these cases only one ended fatally, and in it a post-mortem examination was not available, so that a complete anatomical account of the conditions could not be obtained. Four similar cases, presenting the remarkable clinical picture of a wound in the neck accompanied by hemiplegia and loss of consciousness, and all ending fatally, have come under observation in a casualty clearing station. As a necropsy was performed in every case they appear worthy of record.

CASE 1.—In this case there was a small wound on the left side of the neck, below and behind the angle of the jaw; the exit wound was also on the left side, lower down, about 1½ inches from the middle line behind. An extensive diffuse swelling appeared behind the angle of the jaw; this

[1] THE LANCET, 1916, ii., 543.

swelling did not pulsate, nor was there any bruit. The patient was unconscious and stertorous, and there was hemiplegia affecting the face, arm, and leg on the right side. The patient died about 26 hours after being wounded.

On dissection of the left side of the neck there was noted a localised swelling, with hæmorrhage, on the walls of the external and internal carotid arteries, just above the bifurcation of the common trunk. Two small wounds, with ragged edges, were present, one on the front of the external and the other on the back of the internal artery; these appeared to be sealed up by firm red thrombus which was entangled in projecting shreds of the adventitial tunics, and the thrombus on the back of the inner vessel exhibited a firm pea-like projection backwards. A probe which was readily passed, with light pressure, in at one opening and out at the other evidently traversed the lumina of both arteries. The vessels were removed unopened, the internal carotid being cut across half an inch from the base of the skull. Its lumen was patent at that level, but was filled by thrombus to a point just below. When fluid was poured into the common carotid artery it was observed to make its exit by the external artery, none escaping by the wounds. The lumen of the left internal carotid artery was observed to be patent also at the point where it was cut in removing the brain. The left middle cerebral vessel was normal to a point just beyond the origin of its perforating branches, but was there distended and completely blocked by a red adherent thrombus. The *Bacillus perfringens* was present in this clot in considerable numbers. There was a well-marked condition of early softening of the left hemisphere of the brain, excepting the occipital and frontal lobes. The basal nuclei were normal.

CASE 2.—In the second case there were multiple small bomb wounds, one of which was on the right side of the neck posteriorly. There was a similar non-pulsatile swelling of the neck, and the symptoms produced were similar to those in the first case. The patient died, hemiplegic on the left side, about 18 hours after being hit.

On post-mortem examination much effused blood was present in the tissues of the right side of the neck. The missile, a small fragment of bomb-casing, was seen lying under the right sterno-thyroid muscle, having penetrated the right lobe of the thyroid gland. There was a false aneurysm, about an inch in diameter, on the deep internal aspect of the right common carotid artery; its wall was formed of firm fibrin mixed with blood corpuscles. On slitting up the vessel after removal, a linear wound, ⅜ inch in length, was seen on its posterior and inner wall about 1½ inches below the bifurcation. A firm cylindrical thrombus was adherent to the upper end of this wound and extended upwards for a distance of 1½ inches, lying free in the lumen and only partially filling it. The external and internal carotids were free of thrombus as far as they could be traced in the neck, and the latter was patent also at the point where it was cut inside the skull in removing the brain. The right Sylvian artery was completely occluded by firm red thrombus just beyond the origin of its perforating branches. The right hemisphere of the brain showed well-marked early softening, with the exception of the frontal and occipital poles. The grey matter was swollen, red, and œdematous and had a blurred margin, and contrasted with the normal left side. The basal nuclei were intact.

FIG. 1.

The carotid arteries from Case 3, showing the false aneurysm and the thrombi inside the vessels. The perforation in the wall of the external carotid is quite obscured by thrombus.

CASE 3.—This case was admitted within six hours of being wounded with the same symptoms of stertor and hemiplegia. The patient had been shot through the neck from side to side. On the right side there was a small wound near the posterior border of the sterno-mastoid muscle, about midway between its attachments. Arterial blood escaped freely from this wound when the dressing was removed. The right common carotid was therefore ligatured just above the omo-hyoid; the hæmorrhage was thereby arrested. The patient died without any alteration in the symptoms within 15 hours of being wounded.

In this case a false aneurysm about the size of a walnut was found on the back of the right external carotid artery just above the bifurcation of the main trunk. (Fig. 1.) A small perforation about ⅛ inch in diameter was present in the posterior wall of the vessel at that level. The edges of this wound were ragged and bruised, and the opening was crossed by some residual strands of adventitia with clot adherent to them. The posterior wall of the internal carotid artery was much bruised at a slightly lower level, but was not perforated. Fairly firm greyish-pink thrombus was adherent on the walls of the common carotid artery at its bifurcation, and extended ½ inch upwards in the lumen of the internal and 1½ inches in that of the external vessel, being firmly attached over the bruised areas of intima. The external carotid was the only vessel completely occluded by thrombus. Emboli were present in several branches of this vessel in the neck; the lumen of the internal carotid was free of clot from just above the injury on its wall to its termination inside the skull. The right middle cerebral vessel was normal at its origin, but all the larger branches in the Sylvian fissure were filled by portions of thrombus of the same consistence as that seen in the large vessels in the neck. The island of Reil and the motor area of the right cerebral hemisphere were softened and much congested, while the basal nuclei and the poles of the hemisphere remained normal. A few streptococci were present in films from the thrombi, and a few colonies were obtained on cultivation.

FIG. 2.

Illustrates the complete separation of the common carotid artery, and the sealing of the ends by thrombus. The shape and arrangement of the thrombi indicate that they have formed while the blood was still circulating.

CASE 4. — This case was admitted about six hours after being wounded, already in the same condition, stertorous, and with hemiplegia affecting the face, arm, and leg on the right side. There was a wound on the left side of the neck, about 2½ inches above the clavicle. This patient survived for about 72 hours after being wounded.

Post mortem the left common carotid artery was found to be completely severed and the ends, filled with thrombus, were retracted so as to leave a gap half an inch in length. (Fig. 2.) The ends of the vessel were much bruised and some laceration was present for half an inch upwards on the walls of the upper segment. The thrombus in the lower segment was traced downwards to within an inch of the aorta; that in the upper extended up to the bifurcation of the common carotid, and thence for a considerable distance into the external carotid and its branches and for half an inch only into the internal carotid. The lumen of the latter vessel was patent above that level. On the base of the brain the left Sylvian artery was plugged by firm red thrombus beyond the origins of the perforating branches. This had given rise to cerebral softening, as in the previous cases.

In each of these cases the hemiplegia and cerebral disturbance were caused by occlusion of the middle cerebral artery or its branches. In all four there was thrombus present in the carotid arteries in the neck, consequent on damage of the arterial walls, and in each there were several inches of the internal carotid artery patent between that thrombus and the portion blocking the cerebral vessel. It is consequently a justifiable conclusion that the blood continued to flow for a time, at least, in the wounded vessels, and that the occlusion of the cerebral arteries occurred by embolism. Similar emboli were found in one instance in the branches of the external carotid also.

The damage to the large cervical arteries was in every case considerable. In three there was actual perforation of the wall; in the fourth the trunk was found completely severed, but this, no doubt, occurred secondarily by sloughing, after the vessel was fully thrombosed. It is remarkable that hæmorrhage was so slight in these cases; in only one of them was ligature necessary.

Sir George Makins draws attention to the tardy development and partial nature of the paresis as outstanding

features in his series, and contrasts this with the prompt and complete hemiplegia, followed by a fatal issue in 24 to 36 hours, which may occur after ligature of the common carotid artery. In the four cases related, however, the early appearance and completeness of the hemiplegia and the rapidly fatal issue resemble the effects of ligature of the common carotid. It is natural that such cases, only surviving from 15 to 72 hours, would not reach a base hospital.

We are indebted to the Medical Research Committee for permission to make use of the two drawings by Mr. A. K. Maxwell.

ON THE PRESENCE OF AN ACCESSORY FOOD FACTOR IN THE NASAL SECRETION

AND ITS ACTION ON THE GROWTH OF THE MENINGOCOCCUS AND OTHER PATHOGENIC BACTERIA.

(Preliminary Paper.)

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(Report to the Medical Research Committee.)

1. *Introduction.*

IN dealing with numbers of cerebro-spinal fever contacts during the recent epidemic it was noticed that the growth of the meningococcus was in some instances strongly influenced by the amount of nasal secretion transferred by the swab to the surface of the culture medium. It was found from experiment that if a trace of dilute sterile nasal secretion was added to the surface of the culture medium, it brought about a rapid growth of the meningococcus when this medium was subsequently inoculated with this germ. The growth is always many times the amount obtained on the same medium, on planting out a similar quantity of culture, in the absence of nasal secretion.[1]

The action of sterile dilute nasal secretion in accelerating the growth of the meningococcus would seem to be entirely in the nature of an accessory food body or vitamine, as alone this secretion is quite incapable of supporting or stimulating the growth of this germ. This conclusion is supported by its peculiar properties. It is soluble in water, slightly soluble in alcohol, and almost insoluble in ether.[2] It has great heat-resisting capacity, withstanding autoclaving at 120° C. and boiling in strong hydrochloric acid for 12 hours without losing strength. On filtration it always undergoes considerable adsorption, even when passed through an ordinary filter-paper, and it almost entirely disappears from any fluid when this is passed through a Doulton filter candle. All chemical manipulation, drying, precipitation, &c., appreciably weaken its power of stimulating the growth of the meningococcus.

In addition to the meningococcus and its allies, it has been shown to accelerate the growth of the pneumococcus, *B. typhosus*, *B. coli communis*, various fæcal streptococci, and a number of throat bacteria. It is highly probable that it will accelerate the growth of all pathogenic bacteria when added in sterile fashion to any suitable culture material, whether solid or fluid.[3]

2. *Mode of Collection of Nasal Secretion.*

The nasal secretion used in the following experiments was obtained either by collection direct from the naso-pharynx by means of a suction pump, or by the employment of naso-pharyngeal swabs such as those used in the routine swabbing of cerebro-spinal fever contacts. This latter method proved the most convenient. These swabs are made of ether-washed cotton-wool placed on the ends of flexible wires which are introduced into the naso-pharyngeal region through the mouth retracted within bent glass tubes, so that all contamination from the oral secretion is avoided. The swabs were then extracted in distilled water. It was found that quite a considerable amount of secretion could be obtained in this way. This will be referred to in the following experiments as "dilute" nasal secretion in distinction to that collected "undilute" direct from the mucous membrane of the naso-pharynx, by means of the pump.

3. *The Preparation of Various Extracts of Nasal Secretion.*[4]

(*a*) General treatment in the preparation of aqueous, alcoholic, and ethereal extracts. The cotton-wool was removed from the swab wires and covered with the solvent in glass-stoppered specimen tubes of suitable size, using 1–2 c.c. for each swab. After standing for 24 to 48 hours, the liquid was removed with a pipette, and filtered through a 5 c.c. Swedish acid-extracted filter-paper. Aqueous extracts which were further treated, and all alcoholic and ethereal extracts, were evaporated to dryness on a tepid water-bath at a temperature of about 60° C., the basin being removed before it was absolutely dry when water was the solvent, and then taken up in distilled water, 1 c.c. of water being allowed for each swab extracted.

(*b*) Preparation of hydrolysed nasal secretion. 3 c.c. of undilute nasal slime was heated with ten times its volume of strong HCl in a test-tube standing in boiling water for six hours. More HCl was added to make up for the loss by evaporation, and the heating continued for six hours more. The solution, which was faintly yellow, was transferred to a porcelain dish and the excess of acid was evaporated off on the water-bath with the continual addition of water. When nearly all the acid had been removed the remainder was dried at a low temperature, dissolved in 7 c.c. of water, and made faintly alkaline to litmus paper with N/10 NaOH, about 5 c.c. being necessary.

All the extracts before being sealed up in vaccine tubes were tested and their alkalinity adjusted as closely as possible to Ph. = 7·35 of Sorensen's scale. The extracts after being sealed up were finally sterilised at 55° C. for an hour. All manipulation of the extract was conducted in beakers of Jena glass, or Berlin porcelain or platinum, and great care was taken to have all glassware, especially the slides used for mixing the dilutions, clean and free from any chemicals. The distilled water used was redistilled from glass several times.

4. *Method of Testing the Action of Extracts.*

The action of the various extracts of nasal secretion in stimulating the growth of the meningococcus and other bacteria was tested by making a number of dilutions of the germ in the extract, and planting out each dilution separately and comparing their growth, with a similar quantity of the same emulsion diluted in a similar manner in distilled water or Ringer's solution, and planted out in the same way. It was found after several trials that distilled water offered the best form of control. In the following experiments care was always taken to make the control dilution first and to plant it out immediately. Thus all harmful action of distilled water on the germ was minimised as much as possible.[5] Where typhoid and coli organisms were used all emulsions and controls were made in Ringer's solution.

A large number of methods of dilution were tried. The one found most useful consisted in taking up in a calibrated pipette, finely throttled to ensure accurate measurement, nine volumes of the fluid to be tested, each volume representing 25 c.mm. of liquid. They were then spread out separately on sterile slides. Then with a smaller pipette, also throttled, 5 c.mm. of a standard emulsion[6] of the meningococcus (5000 million to the c c.) in Ringer's solution, was drawn up. This was added to the first of the 25 c.mm. volumes on the slide and thoroughly mixed by drawing it up to a fixed

[1] If sterile dilute nasal secretion be tested against the action of sterile dilute oral saliva in stimulating the growth of the meningococcus, it will be found that oral secretion has also some power in this respect, but this is much less than with nasal secretion. Gordon has shown (Brit. Med Jour., June 17th, 1916, p. 849) that in the unsterile state oral saliva has a marked inhibiting action on the growth of this germ. When the various mouth bacteria were removed from this secretion by sterilisation or the centrifuge, this inhibiting action immediately disappeared.

[2] It can be precipitated with phosphotungstic acid and neutral lead acetate, but this needs further confirmation.

[3] In the experiments described in the present paper the medium used is Crowe's "chocolate medium" (see THE LANCET, Nov. 20th, 1915). In other experiments similar results have been obtained with Gordon's legumen trypagar.

[4] For the proper preparation of the extracts the Medical Research Committee have kindly placed the services of Mr. D. Matthews at my disposal.

[5] I have shown elsewhere (THE LANCET, 1916, ii., 902) that the meningococcus is peculiarly resistant to the hypotonic action of distilled water. I have shown that it can withstand its action for many hours without experiencing any apparent ill-effect.

[6] In speaking of a "standard emulsion" of the meningococcus in the following experiments it will always be understood that one in Ringer's solution of the strength of 5,000,000,000 cocci to the cubic centimetre is meant.

mark each time in the process of mixing. Then from this 5 c.mm. was taken up and transferred to the second 25 c.mm. volume and the mixing repeated. This procedure was gone through in succession with each of the nine volumes. Thus in the end a series of nine successive dilutions of the germ were obtained. Then by means of a fine sterile camel-hair brush or fine capillary tube, a certain quantity of each dilution was transferred in turn to the surface of the culture medium, commencing with the highest and gradually working down to the lowest dilution. The quantity transferred could be accurately measured when a capillary tube was used, but when a brush was employed it was only roughly the same in each instance. The dilutions were spread on the surface of the culture medium by dipping the brush in one of them and then drawing it rapidly across the surface of the plate. This operation was repeated in turn with each of the dilutions. Thus a series of nine parallel lines were obtained on the plate, each representing a particular dilution of the germ in the solution to be tested.[7]

5. *Experiments.*

Experiment I.[8] (Figs. 1 and 2).—A "standard" emulsion of an old laboratory culture of meningococcus (Littledale) was made up in Ringer's solution. 5 c.mm. of this emulsion was added to 25 c.mm. of distilled water and of an aqueous extract (see under Sec. 3*a*) of dilute nasal secretion respectively, and diluted down through nine successive dilutions, and planted out by means of a brush as described under Sec. 4. Thus nine parallel lines, as shown in Figs. 1 and 2, were obtained on the plates,[9] one representing the dilution in nasal secretion extract and the other the control dilution in distilled water. Line No. 1 contains the fewest number of germs, while line 9 contains the largest number. Each line contains very roughly the same number of germs as the corresponding line on the other plate. The plates were incubated at 37° C. for 24 hours and then taken out and the resulting growth photographed. The photographs show the plates reduced to half natural size.

In Fig 1, showing the dilution in distilled water, little growth has taken place except on lines 7, 8, and 9. In the same degree of dilution in aqueous extract of dilute nasal secretion, Fig. 2, considerable growth has taken place on all the lines, and is confluent in the case of lines 7, 8, and 9. A comparison of the two photographs gives a rough idea of the accelerating action of nasal secretion on the growth of the meningococcus.

It was immaterial whether, in this experiment, Ringer's solution was substituted for distilled water in the control dilutions to obviate all possible harmful action of the distilled water; the result was the same. There is possibly a slight increase in the growth obtained in the control, due to the use of Ringer's solution, but this increase was not sufficient to alter the main result of the experiment. There was always a preponderating growth with nasal secretion extract.

Experiment II. (Figs. 3 and 4).—In this experiment, *instead of an old laboratory culture being used as in Experiment I., a freshly isolated strain of the meningococcus (Walters) was taken.* This had been obtained from the spinal canal of a cerebro-spinal fever patient about a week previous. In this instance the dilutions of a "standard" emulsion were made as before in distilled water and nasal secretion (aqueous extract), but instead of a small quantity of each dilution being transferred to the plates by means of a brush, each dilution containing 30 c.mm. of fluid was transferred by means of a fine capillary pipette to the surface of the culture medium. Thus, instead of a series of lines, a series of drops or blebs were obtained representing 11 consecutive dilutions of the germ in distilled water and nasal extract respectively.

A comparison of Figs. 3 and 4 shows the accelerating action of the nasal secretion extract over that of the distilled water one. The figures, however, hardly bring out the proper difference between them, as the spreading of the drops on the surface of the medium has been irregular. Actual inspection of the plate, Fig. 4, shows, for instance, that dilution No. 11, which contains the fewest number of organisms, is very thin and spread out, while No. 1, which contains the largest number of germs, is very heaped up and thick, a condition which is not very obvious from the photograph.

The comparison of dilutions 7–11 of Fig. 4 with the same dilutions in Fig. 3 dispels any doubts as to the accelerating action again of nasal secretion in this experiment.

Experiment III.—In this experiment *it was sought to find out the amount of accelerating action nasal secretion extract brought about on the growth of the meningococcus when growing in a fluid broth medium and not a solid medium as in the former experiments.* To two small vaccine tubes containing each 2 c.c. of sterile glucose litmus broth 5 c.cm. of "standard" emulsion of meningococci (Walters) was added. To one of the tubes in addition 5 c.cm. of an aqueous extract of dilute nasal secretion was added. The tubes were then incubated for 48 hours at 37° C. At the end of this time the tube that had received the nasal secretion in addition to the meningococci had entirely lost all trace of pigment, while that which was without the extract still retained a certain amount of reddened litmus pigment. The tubes were then carefully shaken up to ensure an even distribution of the cocci, and counts were made of a certain volume of fluid from each tube. This showed that there was roughly eight times the number of cocci per c.mm. in the tube with the nasal extract as compared with that without it.

Experiment IV.—In this experiment an attempt was made *to see if prolonged boiling of aqueous extract of dilute nasal secretion had any action in destroying its power to stimulate the growth of the meningococcus.* 4 c.c. of an aqueous extract of dilute nasal secretion was boiled continuously for five hours, distilled water being added from time to time to keep it at the same volume. (See Sec. 3 *b.*) It was then tried out as before, against some of the same aqueous extract unboiled, with a "standard" emulsion of meningococcus (Littledale). It was found that the boiling had had but little or no effect in weakening the action of the nasal secretion.

Experiment V. (Figs. 5, 6, and 7).—In this experiment *hydrolysed nasal secretion prepared by boiling undilute nasal slime with strong hydrochloric acid for 12 hours (as described in Sec. 3 (b)) was tested against the action of the same nasal secretion untreated with HCl.* Dilutions of a "standard" emulsion of a freshly isolated culture of meningococcus (Lake) were made in distilled water (control), nasal slime, and nasal slime hydrolysed, respectively. These were planted out on a plate by means of a brush in the usual way.

Photographs 5–7 show the result of this experiment. It will be seen that the hydrolysed nasal secretion is as active in accelerating the growth of the meningococcus as the same secretion untreated (Figs. 6 and 7). The action of both hydrolysed and the non-hydrolysed secretion in accelerating growth is well shown by comparison of these plates with that planted out with the control dilutions in distilled water. This experiment has been repeated a number of times with different strains of meningococci and always gave the same result.

Experiment VI. (Figs. 8–11).—*To determine the relative power of a plain alcoholic extract of dilute nasal secretion, as compared with a plain aqueous extract and an ether extract of the same in stimulating the growth of the meningococcus.* Dilutions of a standard emulsion of meningococcus (Paul) were made as before. The diluents were distilled water (control), aqueous extract of dilute nasal secretion, plain alcoholic extract of dilute nasal secretion, and ether extract of the same. Figs. 8–11 show the resulting growth obtained after 24 hours' incubation at 37° C. Comparison of Fig. 10 with Fig 9 shows the action of a plain alcoholic extract of dilute nasal secretion to be almost as active as that of an aqueous one, while comparison of both these figures, with the control in distilled water (Fig. 8) shows the amount of acceleration in growth produced.

The conclusion drawn from this experiment was that the active principle in nasal secretion which accelerates the

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[7] If we commence with an emulsion of 5000 million meningococci to a cubic centimetre, and make nine consecutive dilutions of 5 parts in 30 in each dilution, then theoretically we should expect to find in each of the nine dilutions the number of cocci per cubic centimetre as follows:—

Dilution.	Cocci.	Dilution.	Cocci.
1	833,000,000	6	170,000
2	139,000,000	7	18,000
3	23,000,000	8	3,000
4	4,000,000	9	500
5	640,000		

These numbers were never actually approached in the following experiments, as the pipettes and brushes were not sterilised in passing from one dilution to another.

[8] The numbering of the experiments is only for the convenience of the present paper; many of the experiments described have been repeated a great many times.

[9] All the experiments described in this paper refer to implantations on Crowe's "chocolate medium."

EXPERIMENT I.—*Meningococcus "Littledale."*

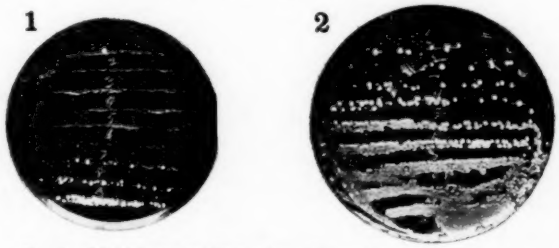


FIG. 1.—Dilutions in distilled water. (Control.)
FIG. 2.—Dilutions in aqueous extract of sterile dilute nasal secretion.

EXPERIMENT II.—*Meningococcus "Walters."*

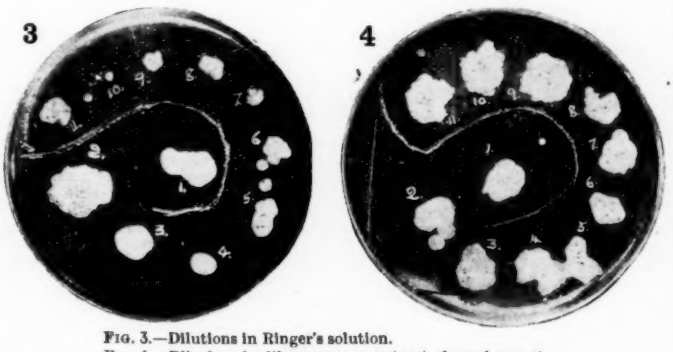


FIG. 3.—Dilutions in Ringer's solution.
FIG. 4.—Dilutions in dilute aqueous extract of nasal secretion.

EXPERIMENT VI.—*Meningococcus "Paul."*

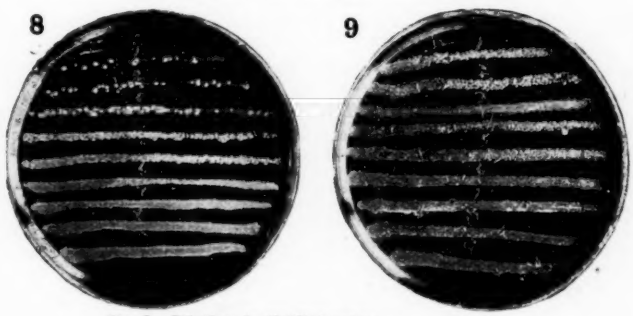


FIG. 8.—Dilutions in distilled water.
FIG. 9.—Dilutions in aqueous extract of nasal secretion.

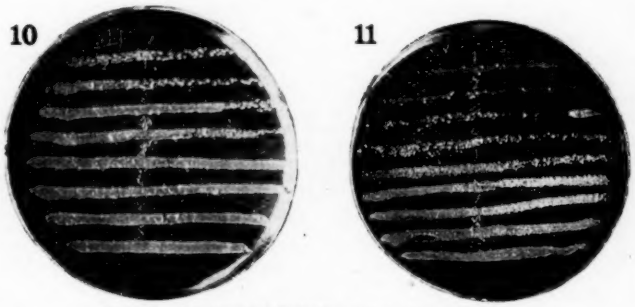


FIG. 10.—Dilutions in alcoholic extract of nasal secretion.
FIG. 11.—Dilutions in ether extract of nasal secretion.

EXPERIMENT V.—*Meningococcus "Lake."*

FIG. 5.—Dilution in distilled water. (Control.)

FIG. 6.—Dilution in aqueous extract of dilute nasal secretion.

FIG. 7.—Dilution in hydrolysed nasal secretion.

EXPERIMENT VII.—*B. typhosus.*

FIG. 12.—Showing the action of dilute nasal secretion in stimulating the growth of *B. typhosus*. The upper half of the plate shows the dilutions of the germ in Ringer's solution, while the lower half shows the dilutions in dilute aqueous extract of nasal secretion.

Cultures (one-third natural size) photographed after 24 hours' growth. The streaks are to be read from above downwards.

growth of the meningococcus is soluble in distilled water, less so in alcohol, and almost insoluble in ether.

Experiment VII. (Fig. 12).—*To determine the action of nasal secretion extract on the growth of B. typhosus* In Fig. 12 the upper half of the plate has been planted out in the usual way with dilutions of an emulsion of *B. typhosus* in Ringer's solution; in the lower half, with dilutions of the same emulsion in aqueous extract of dilute nasal secretion. Fig. 12 shows that a much more abundant growth took place on that half of the plate which received the nasal secretion.

The conclusion drawn from this experiment was that the growth of *B typhosus* is accelerated in a similar manner to that of the meningococcus by an aqueous extract of dilute nasal secretion.

Similar results were obtained in experiments with the following germs:—*Streptococcus zymogenes*, *Micrococcus pharyngeus flavus*, pneumococcus, and *B. coli communis*.

Conclusion.

The outstanding results of the foregoing experiments show that in nasal secretion there is present some body which greatly accelerates the growth of the meningococcus on an artificial culture medium. Alone it is incapable of acting as a food or stimulant to the growth of this germ. It is soluble in water, less so in alcohol, and very insoluble in ether. It has great heat-resisting power, being able to resist prolonged boiling for many hours. It is not destroyed by boiling in the presence of strong hydrochloric acid for twelve hours. In addition to the meningococcus it also stimulates the growth of many other pathogenic germs.

A NOTE ON THE CAUSE AND PREVENTION OF TRENCH FOOT.

BY C. NEPEAN LONGRIDGE, M.D. VICT., F.R.C.S. ENG., M.R.C.P. LOND.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

No one who has had an opportunity of observing many cases of trench foot, particularly in the later stages of the disease, can have failed to be struck with certain characteristics presented by it. The lesions are indolent, slow to heal, and prone to break down again on the slightest provocation. The scar tissue formed is weak and ulcerates easily. Indeed, the whole picture of the disease reminds one irresistibly of the trophic sores appertaining to diseases of the central nervous system. I wish to set forth in this paper my reasons for thinking that trench foot is an affection of a trophic nature.

Some three years ago a book on electro-pathology was published by Mr. A. E. Baines, a distinguished electrical engineer. Space does not permit me to give an account of the far-reaching vista of promise which this little-known work has opened up to medicine. An abler pen than mine has recently put the whole matter before the profession. Let it suffice to say that Mr. Baines believes that the brain, and possibly the cord, is the seat of electrical generation, and that the current so generated is carried to the tissues by means of the nerves, which to the electrician's view are nothing but insulated cables. Here we have the trophic influence of physiology and medicine, that vague generalisation which from our student days we have been content to accept without questioning. Mr. Baines has shown us how to measure and modify this trophic influence, and I venture to predict that in the future his name and fame will equal that of those illustrious ones, Simpson, Lister, and Koch, as benefactors of the human race. This is no mere discovery of an isolated fact in medicine. Many a patient worker has given his brick, his hard-wrought stone of research to the building of the sacred fane of Æsculapius. As is perhaps fitting and proper for an engineer, Mr. Baines has come and shed a flood of light in our temple. For he has given us a fundamental principle.

The dominating factor in the conditions under which trench foot occurs is wet. When a man is standing for days on end in water and liquid mud, his boots, socks, and the skin of his feet and legs become soaked. As is well known, the electrical resistance of the skin is enormously diminished when the skin is wet. Under these conditions a gradual leakage of electricity to earth takes place from the feet. Other things being equal, electricity will always leak from a point in preference to a plane surface, which accounts for the fact that the toes are most affected. This leakage deprives the cells of the foot tissues of their trophic influence and they die. Hence the lesions of trench foot.

Local leaks of electricity may be detected by a suitable galvanometer. One pole of the galvanometer should be connected to a silver plate about the size of a florin, which is fixed in the centre of the patient's forehead; there is no special reason for fixing it on the forehead except that it is the most convenient spot in the middle line of the body. The other pole is connected to a contact plate mounted in an insulated handle so that the contact or electrode can be placed on any portion of the body it is desired to test. Before testing it is necessary to "earth" the patient in order to dissipate any induced charge of electricity of which he may be the host. If this is not done the patient's own intrinsic current may be swamped by charges he has picked up from trams, electric trains, or other sources. With both poles in contact with the body the galvanometer will give a deflection. When leakage is taking place from any particular area a high and rapid deflection is noted. I have been examining and treating various cases on Baines's principles for a matter of about two years, and have found such a leakage taking place from the feet and legs of soldiers suffering from trench foot whom I had under my care last spring. Moreover, the results I obtained by treating these cases by dielectric oil were better than the results obtained by any other method I tried. I also made a few experiments bearing on this subject.

Experiment 1.—With the aid of Miss Flecker, at the Ladies' College Physical Laboratory, Cheltenham, I estimated the electrical resistance of a piece of oak tanned sole leather 3 inches long by 1 inch wide. We found that when dry the resistance was practically infinity. When wet the resistance is that of the fluid the leather has soaked in.

Experiment 2.—One pole of the galvanometer was connected to an electrode which could be held in the hand. The other pole was connected by an insulated cable to a copper plate imbedded in the earth. Another insulated cable was connected at one end to the metal pipe supplying water to the house, and at the other end to a brass rod of 1 inch section. After earthing myself I held the brass rod in one hand and the electrode in the other, and obtained a rapid off-scale deflection, showing, firstly, that an electric current was coming from my body; and secondly, that the earth connexions were working properly, for the current passed out by one hand through the brass tube to the water pipe, thence about 20 feet through the earth to the copper plate, and through the galvanometer to the other hand, so completing the circuit.

Experiment 3.—The brass tube was then laid on the floor which was covered by a thick carpet. I held the electrode by one hand and put both feet on the brass tube. I wore ordinary boots which were dry. No deflection was obtained because the dry leather soles of my boots insulated me from the earth. I then took my boots off and put my bare feet on the tube and obtained an off-scale deflection.

Experiment 4.—Next day was wet and I walked about half a mile so that the soles of my boots, which were free from holes and metal nails, became wet. On holding the electrode in one hand and placing my feet on the brass tube, a rapid off-scale deflection occurred, showing that current was passing through my boots to earth.

Experiment 5.—The pole of the galvanometer connected to earth by the copper plate was disconnected. It was reconnected to a hand electrode exactly like the one previously used, so that the galvanometer was now connected to the hand electrodes only. After the necessary earthing process, I held the electrodes in the hands and obtained a deflection which remained steady at 170 mm. I then placed my feet, still in wet boots, on the brass tube and awaited results. The light on the scale very slowly began to recede towards zero. I repeated this experiment several times. The light never remained at zero, but if it got as far went over to the other side of the scale, and generally registered 40 to 60 mm. I take this as evidence that electricity was gradually leaking out of my body to earth, through my wet feet. One would not expect the light to register zero as there is continuous generation of electricity in the body. In view of these experiments, the grandmotherly advice we have so often received, not to stand about in wet boots, takes on a new and important significance which ought to claim our belated respect. They also to my mind afford evidence that trench foot is probably caused by long-continued leakage of electricity from the feet.

I noted that Dr. Leonard Hill had advocated rubber boots and greasing of the feet for the prevention of the disorder, recommendations with which I cordially agree. I sent to him in the spring a note about my own experiments, and

received from him a courteous letter thanking me for my "ingenious speculations," but countering me with the query "What about fishes, fishermen, and Channel swimmers?" When truth is really truth the most knock-out objections often end in being pillars in its support. Just as the vagaries of radium appeared to undermine the whole structure of physical science, and now form an additional proof that the foundations of that science have been well and truly laid, so Dr. Hill's objections assist my argument. For fishes are provided with a dielectric coat of mucus; I never heard of fishermen who had wet feet as long as the men in the trenches: and Channel swimmers always try to emulate the fish by rubbing themselves with a dielectric coat of oil. Their idea is to keep out the cold—it is really to keep in the electricity of their bodies; improved methods of accomplishing this result will at once suggest themselves to anyone acquainted with Baines's work.

The experience of officers at the front is that trench foot can be prevented. I am certain it can, but it can only be done, firstly, by keeping out the wet, and, secondly, by keeping up the electrical resistance of the skin of the feet. The feet should be thoroughly greased, and by far the best grease to use is the dielectric ointment which is now an article of commerce. It is interesting to note that our French colleagues are suggesting the use of ambrine for trench feet; they have had very good results with it in burns, but it is used empirically without appreciation of its dielectric action. I doubt if anything could improve on the results obtained by dielectric oil in cases of burns.

Rubber boots if worn for any length of time cause the feet to perspire too freely. White Robertson in the paper referred to above has shown that the soles of the feet and palms of the hands are parts which are designed to sweat freely and through which the normal escape of electricity to earth mostly takes place. The disadvantage of rubber boots is that owing to the excessive perspiration they cause the skin of the feet is liable to become sodden and so lose its electrical resistance. Soaking the boots, socks, and puttees in oil is the alternative I suggest for rubber boots. Any thick oil would do as a preventive; kitchen fat rendered with olive oil or cotton-seed oil might be tried, but I think that the skin of the feet should be rubbed with a dielectric grease. If signs of trench foot should develop in cases where these precautions have not been efficiently carried out, the best treatment is to wrap the foot and the whole of the lower part of the limb as far as the knee-joint in gamgee tissue soaked in dielectric oil. I have seen enough of this treatment to justify the assertion that no serious case of trench foot necessitating amputation need take place.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF SARCOMA OF THE MEDIASTINUM INVADING THE LUNG.

BY A. G. M. GRANT, M.D. EDIN., D.P.H.,
FIRST ASSISTANT MEDICAL OFFICER, WESTMORLAND SANATORIUM, GRANGE-OVER-SANDS.

THE following case illustrates the points of resemblance between phthisis and malignant disease of the lung. On the admission of the patient to the sanatorium seven weeks before his death the clinical picture was in the main one of phthisis, but in the later stages the distinguishing features of thoracic tumour manifested themselves and suggested malignancy.

A man, aged 55 years, was admitted to the Westmorland Sanatorium on Sept. 13th, 1916, with a history of good health until the previous April when he first complained of radiating pain in the front of his chest, followed shortly afterwards by cough and expectoration, which compelled him to give up work in July. His sputum was copious and mucopurulent, of a yellowish brown colour, and well intermingled with blood. No T.B. were found. Examination showed deficient expansion, dullness, high-pitched breath sounds almost tubular in character, and increased vocal resonance over the upper lobe of the right lung. Over the apex of the right lower lobe the signs were somewhat similar but less pronounced. The left lung seemed healthy. There were no cardiac murmurs and the urine was normal. His chief complaint was of the flitting pains across his chest, which were generally most severe at night. Cyanosis, first noticed in the lobules of his ears early in October, gradually spread to the face, while there was none of the extremities. With the deepening of the lividity there developed œdema. His lower eyelids became heavy with watery bullæ and his neck swollen, measuring on the day of his death 17 inches at the level of the thyroid cartilage, while in health he wore a collar of 15½ inches. The external jugular veins stood out prominently. The superficial veins of the chest became distended, more markedly on the left side, and running along the left costal margin corresponding to the attachment of the diaphragm was a network of dilated venules. The superficial abdominal veins were not distended. There was no swelling of the arms or legs. The glands at the root of the neck and in the axillæ were enlarged. The pupils were equal and so were the radial pulses. Towards the end he became very drowsy, even falling asleep during conversation. His breathing became stertorous and he died on Nov. 1st. A differential blood count made after the cyanosis became evident showed polynuclears 92 per cent., lymphocytes 3 per cent., and mononuclears (large) 5 per cent. The Arneth count gave a ratio of 46 to 54. The temperature was normal until the last few weeks, when there was a slight rise, but not beyond 99·4° F., with a small daily variation. At the post-mortem examination it was found that a large solid mass filled the superior and the posterior mediastinum. The pleura covering the right lung was firmly adherent. The upper lobe of the right lung was almost entirely invaded by tumour, and there was involvement of the upper portion of the lower lobe. The left lung and its pleura were healthy. Microscopically the tumour was seen to be a lympho-sarcoma. A section showed the growth destroying the wall of the superior vena cava and projecting into its lumen.

The case is of interest in showing the difficulties attendant on the making of a diagnosis of phthisis in the absence of tubercle bacilli from the sputum. The blood examination was helpful, although, unfortunately, a count was not made until the later stages of the illness. The high polynuclear count suggested an acute mixed infection if the case were really tuberculous, but the nearly normal temperature negatived such an infection. The Arneth count was practically normal, while, according to the findings of different observers, an active tuberculosis causes a definite deviation to the left.

For permission to publish this case I am indebted to Dr. C. F. Walker, medical superintendent of the Westmorland Sanatorium.

Grange-over-Sands.

A CASE OF LARGE OMENTAL CYST IN A CHILD.

BY FREDERICK C. PYBUS, M.S. DURH., F.R.C.S. ENG.,
SURGEON TO THE HOSPITAL FOR SICK CHILDREN; ASSISTANT SURGEON TO THE ROYAL VICTORIA INFIRMARY, NEWCASTLE-ON-TYNE.

OMENTAL cysts are sufficient rarities to warrant the publication of individual examples. The following notes are those of a patient in the Hospital for Sick Children, Newcastle-on-Tyne.

The patient, a girl, aged 4 years, was admitted to hospital in June, 1915, supposed to be suffering from tuberculous peritonitis. She was the only living child of a family of three, the mother having died of phthisis. It was noted that the child's abdomen had been swollen since she was 9 months old. She had been tapped on two occasions at the ages of 18 months and 2 years, but on each occasion the fluid gradually returned. After admission she was again tapped, six pints of fluid being removed. A few weeks later she developed scarlet fever and was transferred to the fever hospital. The photograph shows the condition of the abdomen at this period.

She was readmitted to the hospital in May, 1916. The circumference of the abdomen was 29¼ inches. She was tapped twice shortly after admission, two pints being removed on each occasion. The fluid was of a slightly reddish colour and contained cholesterin crystals. I was then asked to see her by Dr. J. E. Dainty, who suggested that the condition might be a cyst and that abdominal exploration would be advisable. She was transferred to my ward and an operation was carried out in June, 1916. The

abdomen was opened above the umbilicus. A thin-walled cyst was found occupying the larger part of the abdomen. Three fine strands passed from the cyst to the abdominal wall, which I regarded as due to the previous aspirations. The cyst was tapped and drawn outside the abdomen. It was thin-walled, partially loculated, and situated in the great omentum. It was readily stripped from the omentum except at one part where the omentum was torn, and its upper part had to be peeled from the greater curvature of

Omental cyst in a girl of 4 years. Circumference of abdomen, 29½ inches.

the stomach. The omentum was repaired, completing the anterior wall of the lesser sac. The abdomen was then closed. The child made a perfect recovery and was discharged a fortnight later. The cyst was of the size of a large football. The exact quantity of fluid was not measured, but half-filled an ordinary pail. The cyst was occupied by a thin brownish fluid containing cholesterin crystals and was partially divided into several loculi. Portions of the great omentum were removed with the cyst and remain adherent to its wall. Microscopic examination of its wall revealed no epithelial layer, so that it is difficult to account for its origin.

Newcastle-on-Tyne.

DONATIONS AND BEQUESTS.—The Chelsea Hospital for Women has received from the trustees of the Zunz Bequest £5000, being the balance of the £10,000 generously promised by the trustees towards the rebuilding of the hospital.—The trustees of the late Miss Marjory Shanks Schaw, of Glasgow, have given £60,000 to the Western Infirmary, £40,000 to the Victoria Infirmary, Glasgow, and £10,000 each to the Royal Samaritan Hospital for Women, the Royal Hospital for Sick Children, the Royal Maternity and Women's Hospital, and the Association for the Relief of Incurables, all Glasgow institutions.—The late Mr. John Sloughgrove, of Purleigh, has bequeathed £150 to the Essex County Hospital, £200 each to the Royal London Ophthalmic Hospital and the Reedham Asylum for Fatherless Children, £300 to Dr. Barnardo's Homes, and £250 each to the London Hospital and the Eastern Counties Asylum for Idiots.—The late Miss Isabella Mary Peploe-Smith, of Onslow-square, S.W., bequeathed £500 each to the Cancer Hospital, Brompton, the Consumption Hospital, Brompton, and the Society for the Prevention of Cruelty to Animals.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF HISTORY OF MEDICINE.

Casanova's Mémoires.

A MEETING of this section was held on Dec. 20th, 1916, Dr. NORMAN MOORE, ex-President, being in the chair.

Dr. J. D. ROLLESTON read a paper on the Medical Interest of Casanova's Mémoires. He said that as a child Casanova appeared to have suffered from adenoids and small-pox. His sanguine temperament predisposed him to epistaxis, to which he was subject from childhood, and to piles, which he first developed during one of his imprisonments. From early adult life onwards he had attacks of fever, possibly malarial in origin, and at the age of 45 he had a severe attack of lobar pneumonia. He had numerous attacks of venereal disease—gonorrhœa and soft chancre, and possibly syphilis, as might have been expected from his own account of his life. He apparently sought medical advice on each occasion, and no sequelæ resulted. In old age he suffered from gout, and his death was probably due to septic absorption, secondary to enlargement of the prostate. Originally intended for the medical profession, Casanova retained throughout his life his interest in medicine, as is shown by his descriptions of disease, his criticism of doctors his dogmatic opinions on medical subjects, his successful simulation of various maladies, and his incursions into the field of therapeutics.

Reviews and Notices of Books.

Diseases of the Umbilicus.

By THOMAS S. CULLEN, M.B., Associate Professor of Gynæcology, Johns Hopkins University. With 269 illustrations. London and Philadelphia: W. B. Saunders Company. 1916. Pp. 665. Price 35*s.* net.

THIS volume contains a complete account of the various diseases affecting the umbilicus and the urachus. Not only has Dr. Cullen collected all that is known about these conditions, but he has also carefully recorded the more important cases, so that his work will be invaluable for reference to any future workers and serve as a foundation on which they may build.

It would seem hardly possible that so many pages could be needed to describe the diseases of so small an area of the body as the umbilicus. This book, however, deals not only very fully with all the known diseases of the navel, but also with such other matters as the omphalomesenteric duct and vessels, Meckel's diverticulum, and the urachus. The importance of the embryology of the umbilicus is very considerable because so many of the lesions are due to a partial or complete lack of closure of the omphalomesenteric duct or of the urachus. The section devoted to this subject is extremely clear and is illustrated by a very fine series of drawings by Max Brödel. The many interesting and instructive points which a detailed study of the anatomy reveals are well set out in Chapter II., and the four plates showing the different forms of the umbilicus will be a revelation to those who have never studied this region particularly. Umbilical infections and hæmorrhage in the new-born child happily have lost the importance they once had, but an account of many of the old epidemics is given by the author and their relation to infections of the umbilical stump clearly shown. A large number of cases of the curious tumours formed by remnants of the omphalomesenteric duct, the so-called umbilical polyp, are collected and given in full, while the chapters dealing with a patent omphalomesenteric duct and prolapse of the bowel through such a duct are most interesting. As the author rightly points out, when a small umbilical polyp is noted after the cord has come away, the probable persistence of other portions of the omphalomesenteric duct, such as a Meckel's diverticulum or a cord from the mesentery to the umbilicus, must be remembered and the added possibility of intestinal obstruction developing later in life explained to the parents. It is interesting to find that most of the cases of so-called dermoids of the umbilicus turn out on further investigation

to be nothing more than inflammation due to the irritation of an umbilical concretion, the presence of caseous material and wool from the patient's clothing having led to an erroneous diagnosis in many of the cases. Records of cases of Paget's disease, diphtheria and syphilis of the umbilicus are given, and also numerous cases illustrative of the escape of intra- and extra-abdominal fluid, mostly pus, through the umbilicus as well as cases of umbilical fistulæ.

Among the most curious of all the conditions described is the series collected by Dr. Cullen of umbilical tumours containing uterine mucosa or remnants of Müller's ducts, in reality adenomyomata of the umbilicus. It was a case of carcinoma of the umbilicus which first led the author to a study of the whole subject, and the chapter on that condition contains the records of many cases of both primary and secondary carcinoma of this region. These clinical histories show that the development of a small, hard umbilical nodule in a patient at or beyond middle age should at once raise suspicion as to the presence of some intra-abdominal malignant growth, and if there be symptoms suggestive of carcinoma of the stomach or gall-bladder the probability will become almost a certainty. Urachal anomalies, such as cysts, large and small, simple and infected, patency of the urachus and urinary fistulæ, may give rise to a great deal of inconvenience and present clinical features often difficult of diagnosis. They are all, however, very fully described by the author, and a reference to this work should assist in clearing up many diagnostic puzzles of this nature.

The whole is a monument of industry and skill, and will form the most complete and important work on this subject for many years to come.

Tratado de Pediatria.

Por el Dr. MARTINEZ VARGAS. Tomo I., Fundamentos de la Pediatria. With 12 figures and 27 plates. Barcelona: J. Vives. Pp. xiv.–959.

Dr. Martinez Vargas, who is professor of pædiatry in the University of Barcelona, founder and President of the Spanish Pædiatric Society and member of many learned societies, both Spanish and foreign, is to be warmly congratulated on this first volume of what, if the standard here set is maintained in the two further volumes promised, will be a really monumental contribution to the study of his subject, using the word in its widest and most comprehensive sense. Dr. Vargas connotes by pædiatry not merely the study of the diseases of children from the standpoints of pathology, diagnosis, and therapeutics, but also a fairly detailed consideration of the anatomy, physiology, hygiene, and vital statistics of infancy and childhood; he pays some attention to the history of pædiatry, its literature, and its development in civilised countries throughout the world.

In the first chapter, headed "General Considerations" (*Generalidades*), Dr. Vargas defines pædiatry as that department of medicine which takes for its subjects of study infancy and childhood in such of their aspects and relations as are of special interest to the physician. He goes on to discuss the limits of the subject and some of the special characteristics of infancy and childhood, their vulnerability to morbific influences on the one hand, their quick reaction and recovery on the other, the readiness with which anæmia comes on in any complaint tending to chronicity, the rapidity with which, in serious illnesses, exhaustion both supervenes and is recovered from, the influence of growth, and the preponderance of the lymphatic system. Next he deals with the anatomy of infancy and childhood, when the thymus gland, its anatomy and special functions are discussed fully. Then, after describing the special physiology of the new-born infant, he passes to a detailed consideration of the subject of infant feeding. This section is of especial value and is abreast of our present knowledge of the subject. Sections on dentition and growth complete the consideration of the special physiology of children, and the remainder of this section is devoted to digestion, respiration, and other functions common to the child and the adult. For the rest, the book deals systematically with the hygiene, pathology, and therapeutics of childhood.

The author's treatment of his subject is thorough and is characterised by a lucidity and sureness of touch which are the obvious fruit of wide knowledge and practical experience. The publisher is to be congratulated on the excellence of the plates and figures illustrating the work.

LIBRARY TABLE

Infection and Immunity: A Text-book of Immunology and Serology for Students and Practitioners. By CHARLES E. SIMON, B.A., M.D., Professor of Clinical Pathology at the College of Physicians and Surgeons, &c., Baltimore. Third edition, revised and enlarged. Illustrated. London: Baillière, Tindall, and Cox. 1916. Pp. 352. Price 14*s.* net.—Dr. Simon's practical and clearly written book has been brought up to date, and some new matter introduced. Abderhalden's protective ferments receive sufficient notice, and recent work on the Wassermann reaction has necessitated the re-writing of this section. Allusion is briefly made to more speculative work, such as the avoidance of anaphylactic shock by the production of anti-anaphylaxis, and the recognition of protection against diphtheria toxin by an allergic reaction. The treatment of the whole subject gains greatly in interest in this way. Dr. Simon primarily conceived his book for the enlightenment of the general practitioner. In its present form he believes that it may serve as a basis for a course of systematic instruction, and in this we agree with him.

The Charaka Club. Vol. IV. New York: William Wood and Co. 1916.—The fourth volume of the proceedings of the Charaka Club has much the same character as that of its predecessors, to which we have already made reference in these columns. The members of the club number some of the most prominent medical men who are practising or who have practised their profession in the United States; its object is to read papers and to promote discussion upon medico-historical subjects. There is no doubt that the interest of medical men in literary and artistic matters bearing on medicine has steadily increased of late, and to this agreeable fact it is quite likely that the publications of the Charaka Club have contributed, for the first two volumes are now out of print, and their messages must have been widely disseminated, though the membership of the club is small. The most important article in the present volume is a learned and fully illustrated dissertation upon Saint Cosmo and Saint Damien, the patron-saints of surgeons, apothecaries, and barbers, whose presentations confront us so frequently in the picture-galleries of Venice and Florence. Other interesting papers are one by Dr. Collins on the literary leanings of the physicians of the eighteenth century and one entitled "The Development of Anatomical Illustrations of the Nervous System," by Dr. C. L. Dana. Vesalius stands out among all the early illustrators of neurology for his knowledge and accuracy, but the diagrams made practically at the same time—i.e., 1545—by Charles Estienne (Stephanus) are wonderfully good, judging by the examples furnished by Dr. Dana. A sad history attaches to a sketch of the history of the University of Alexandria, as the author, Dr. J. G. Mumford, died just before its publication. A biographical note on Antonio Scarpa is supplied by Dr. A. G. Gerster. Dr. Pearce Bailey sends a short story of some medico-psychological interest, and the Bacon and Shakespeare controversy is reviewed from the botanical aspect by Dr. G. L. Walton.

The Care of the School Child. Edited by JAMES KERR, M.A., M.D.Cantab. London: The National League for Physical Education and Improvement. 1916. Pp. 230. Price 2*s.* 6*d*.—Bishop Boyd Carpenter introduces the reader to an admirable series of popular monographs, each by an expert, reprinted from lectures delivered under the auspices of the National League for Physical Education and Improvement during the summer months of 1916. The lectures are popular in the best sense; they may readily be understood by anyone who cares to read them with attention, but they contain the most recent knowledge on the subject in hand and the proper deductions from this knowledge. The chapters on malnutrition and the cripple child seem to us specially helpful. The book will be read with advantage by parents, teachers, nurses, health visitors, medical students, and even practitioners.

Human Temperaments. By CHARLES MERCIER, M.D.Lond., F.R.C.P.Lond. London: The Scientific Press, Limited. Pp. 91. Price 1*s.* net.—Dr. Mercier in this small book sets out the description of ten well-known types of character drawn from his personal study of men and women. He begins by amusing and adroit chapters defining temperament generally, cleverness, and capability, and proceeds to describe the artistic, religious, envious, jealous, and suspicious temperaments, the man of action the practical man, the man of

fads, the man of business, and the philosopher. The essays are written in Dr. Mercier's well-known style—they are witty, pithy, and dogmatic, and display a wide range of observation and learning. Thinking people must endorse a great many of Dr. Mercier's generalisations—a statement which is likely to tempt Dr. Mercier to modify them; but no one who presumes to have opinions of his own, and who possesses any experience with which to back them, is likely to agree completely with him, so that opportunities for battle are provided. We recommend the brochure cordially to our readers. It is always extremely readable and often very wise.

Wheels: An Anthology of Verse. Oxford: B. H. Blackwell. Pp. 84. Price 2*s.* 6*d.* net.—We are not often asked to express an opinion upon verse, and, when we are, the object of the writer has generally been the illustration by social incidents or pathological phenomena of some medical doctrine or moral. Such volumes are almost invariably failures, dull when they are serious and unspeakably so when they are in jocose vein. "Wheels" has no medical aspects whatever, save the unconscious revelation by the authors that the psychology of the cultivated youth of to-day finds ready and graceful expression in verse—where their fathers wrote short stories and their grandfathers long essays, they sing. The camps and the trenches during the past two years have produced many copies of verses having claim to notice as beautiful poetry, and "Wheels," though little of its contents may have been written in the circumstances of war, has an origin similar to that of the rapidly increasing war anthology. It is composed, speaking for its common and essential quality, of impressions suddenly seized and handed on by writers who are conscious of what has been suggested to themselves and who are determined to share the suggestion with others. The idea of these young poets is that the rôle of poetry is rather to crystallise fleeting views and aspects, to catch and fix vague and half-formed ideas, than to do any of the brave things associated in popular literature with the title of poet—to lead, to uplift, to amaze. The inspiration of these nine different writers—different in style, technique, and standard of accomplishment—has been a common one. They strive to show that any impression received by one person should be communicable to others by the medium of symbolic word-pictures; and, says the preface,

> Our words are turned to spokes that thoughts may roll
> And form a jangling chain around the world
> (Itself a fabulous wheel controlled by Time
> Over the slow incline of centuries).

We recommend the book to lovers of verse, leaving them to decide which spoke of the wheel they prefer, and to guess which individual singer is most likely in the future to gain a large audience or make a stronger individual effort. The contributors are Edith, Osbert and Sacheverell Sitwell, E. Wyndham Tennant, Arnold James, Victor Perowne, Nancy Cunard, Helen Rootham, and Iris Tree.

Poland's Case for Independence: A Series of Essays illustrating the Continuance of Her National Life. London: George Allen and Unwin, Limited. Pp. 352. Price 7*s.* 6*d.* net.—The essays which make up this book have been supplied by the Polish National Committee and have been written to prove that the national life of Poland has never ceased to exist, despite the brutal fate which has been meted out to the country by the militarism of more powerful States. The book interprets the manifestation of that life to foreigners, and especially to the people of Great Britain, who have been persistently friendly to the Poles, and in our opinion the claim of the writers is made entirely good that a country which has manifested such indestructible vitality has a right to the independence she claims. The essays comprise one by Dr. R. W. Seaton Watson on the landmarks of Polish history and another by Mr. Rajmund Kucharski describing the persistent struggle for independence. Mr. Arthur E. Gurney contributes usefully on the population question, showing what were the extensive territories which up to 1772 constituted the Commonwealth of Poland and what were the nationalities of the various inhabitants. This chapter appropriately precedes an essay by Mr. Stanislaw Posner upon Poland as an independent economic unit; and the book closes with sketches of the history of intellectual Poland, its literature, art, and music. From the outset of the war it has been felt that the settlement of Poland will form a question of the utmost importance, and one whose adjustment requires a sympathetic knowledge of Polish affairs such as is here shown.

JOURNALS.

Annals of Tropical Medicine and Parasitology, Vol. X., No. 1.—This number of the annals contains four articles, three of which are contributed by Dr. J. W. Scott Macfie, of the West African Medical Staff, and pathologist to the colony of the Gold Coast, the fourth being furnished by Professor J. W. W. Stephens, of the University of Liverpool. Dr. Scott Macfie's first paper describes a fourth variety of trichonocardiasis affecting the shafts of the hairs in the axilla and groin, and caused by *Nocardia tenuis*, either alone or associated with a chromogenic organism. His second contribution is entitled "Observations on Urinary Amœbiasis," and in this he makes reference to three cases which were recently investigated in the Gold Coast, the infection in these instances, as well as in the few others already reported by previous observers, being due to *Entamœba histolytica*. Urinary amœbiasis, it appears, may be due to a primary infection, or it may be secondary to amœbic dysentery. Cystitis, tumour of the bladder, and gonorrhœa are said to be predisposing causes. Dr. Scott Macfie's third contribution deals with the morphology of certain spirochætes of man and other animals, and is illustrated by a number of drawings in the text. He describes a spirochæte which was found in the discharge from a mild case of vaginitis in a native woman, this organism being regarded as the causal agent of the disease. Another spirochæte was discovered inhabiting the bladder of a male patient suffering from chronic cystitis; while a third variety of spirochæte was found in the throat of a native affected by pharyngitis. Included in this paper are some interesting observations on the intestinal spirochætes of certain of the lower animals, including the monkey, rat, sheep, cattle, goat and pig, in the fæces of which spirochætes of the *S. eurygyrata* type were discovered. Professor Stephens's paper is a continuation of his previous "Studies in Blackwater Fever," and in it he urges the importance of population statistics being supplied in connexion with reported cases of this disease. He points out that it is high time that the disputed questions regarding this malady were settled, and that systematic attempts should be made to obtain detailed information from official and other sources in localities affected by blackwater fever. The incompleteness of the statements sent by some observers often rendered their contributions entirely valueless. For the assistance and guidance of those who may in future compile local statistics of this disease, Professor Stephens puts forward several forms which can be filled up, giving all the information that is needed.

British Journal of Ophthalmology.—The appearance of the first number of this journal, the title-page of which is the epitaph of the Royal London Ophthalmic Hospital Reports, the *Ophthalmic Review*, and the *Ophthalmoscope*, marks the beginning of a new era in the literature of British ophthalmology. The journal is in the enviable position of being without a rival, a position which is not free from danger. Judging, however, by the first number and by the imposing list of names of the editorial committee, which includes ophthalmologists of all parts of the Empire, there would seem to be little fear of the journal succumbing from lack of driving power. The editor, Mr. Sydney Stephenson, founded the *Ophthalmoscope* and by his zeal and skill made it a great success. His long experience is a most valuable asset, and he is ably seconded by the assistant editor of the *Ophthalmic Review*, Mr. Erskine Henderson. After a few remarks on the origin of the journal, and the expression of a cordial welcome by American colleagues, the Nestor of English ophthalmology, Mr. Priestley Smith, leads off with a highly scientific communication on the Blood Pressure in the Eye and its Relation to the Chamber Pressure. We consider it a good omen that original research is thus early and emphatically recognised, and that the second place should be given to pathology in a paper on Choroidal Melanomata by Mr. Foster Moore. Then follow three papers on the removal of foreign bodies by the magnet, the most important of which, by Mr. M. H. Whiting and Mr. C. Goulden, records the experiences and lessons of war work in France. In the abstracts from ophthalmic literature the excellent method of collecting several papers on allied subjects for review is adopted. Book notices and notes on matters of current interest conclude the number. Of the 74 pages, 42 are devoted to original communications. The paper, printing, and numerous illustrations are all excellent. We wish our new contemporary every success.

THE LANCET.

LONDON: SATURDAY, JANUARY 13, 1917.

Preventive Treatment in Relation to Venereal Disease.

IN every infectious complaint there is a stage between infection and the appearance of evidence of disease, that symptomless incubation period which is still full of mystery in spite of our increasing knowledge of the life-history of disease germs. This period should logically be the most favourable time for treating disease or—if exception be taken to the word treatment in this connexion—for the *preventive treatment* of disease, reserving the word *prevention* for the avoidance of infection. Regarding the incubation period, then, as an ideal time for the application of measures of preventive treatment, the field of such treatment becomes a vast one if we only are aware in every case when infection actually takes place. In most instances, however, exposure to infection passes entirely unnoticed, or if noticed the chances of escape are so great, and the risk from disease itself so small, as to lead most people to neglect treatment even if available. Only in the case of dangerous and awe-inspiring plagues, such as small-pox and tetanus, is the demand for preventive treatment on the part of those who have been exposed to infection an urgent one, and it is well known how successful is the immediate vaccination or revaccination of small-pox contacts and the preventive inoculation with tetanus antitoxin of the victims of grievous wounds.

There is, however, a special case for preventive treatment. The possibility of infection with venereal disease must be present to the minds of all, excepting the most carelessly ignorant, of those who indulge in promiscuous sexual intercourse. A definite occasion for infection has been present which cannot be overlooked, and Sir BRYAN DONKIN'S letter to the *Times* last week calls attention to the fact that it would be a fresh safeguard to the community as well as to the individual to antedate the treatment for venereal disease to the period of incubation, before the symptoms have had time to appear. Scientific research has, he says, shown conclusively that venereal infection can be prevented more surely than it can be cured by even the best methods of prompt treatment, and this fact was securely established by the precise experiments of the late Professor METCHNIKOFF. Sir BRYAN DONKIN'S allusion is to the method of inunction of a calomel ointment as soon as possible after exposure to infection, described by METCHNIKOFF in his Harben lectures delivered in London ten years ago and translated from the French in our columns at the time. How far progress has been made since then is witnessed by the fact that in military administration, directed to the only organised group of society in which, before the awakening of to-day, measures had been adopted to deal with venereal diseases, this inunction has already become a routine measure. An Army Order issued in March of last year directed medical officers to arrange an organised system by which soldiers who had exposed themselves to the danger of venereal infection were required to attend for treatment within 24 hours of infection. Men returning to barracks at any hour of the day or night were to have access to a room in the charge of an orderly who should superintend an efficient urethral irrigation with permanganate solution and an inunction into the glans penis of calomel ointment (calomel 33 parts, lanolin 100, vaseline 10). We understand that in the case of one battalion of 1700 men in which these facilities for preventive treatment were introduced the incidence of venereal disease immediately fell to less than a quarter of its previous figure.

The value of early preventive treatment, then, in the case of venereal disease is as well established as it is for small-pox and tetanus, and its wide application is equally indicated in the interests of individual and public health. Early preventive treatment must take its natural place in any well-considered scheme for control of venereal disease. It may well be that provision for the use of civilians of the facilities already provided for soldiers would result in a similar limitation of disease, and thus of the necessity for prolonged treatment. We are only concerned now to consider in any detail the medical aspect of the question, believing, as we do, that here as elsewhere physical and moral hygiene go hand in hand, and that it is impossible to develop one at the expense of the other. It has now come to be generally accepted that the provision of early and effective treatment of the diseases acquired by promiscuous sexual intercourse is not going to increase the incidence owing to the removal of moral restraint; but the idea of a Mikado-deity who must not be thwarted in his schemes for making the punishment fit the crime has died very reluctantly. The same mediæval doctrine has been applied during the lifetime of most of us to the treatment of the later stages and of the sequelæ of syphilis and gonorrhœa. Not only did some of our medical charities refuse, with the countenance of the regulations under which they were founded, to assist the victims of venereal disease, as far as they were able to diagnose such victims, but even the medical schemes organised by the public for mutual medical benefit—medical aid associations and sick clubs—withheld treatment from venereal sufferers. We have changed all that, and to-day the municipal schemes for the control of venereal diseases concern themselves keenly with the treatment of the earlier stages of those diseases. The application of the same doctrine to early preventive treatment is a logical step forward, and ought to be taken at once.

Mobilisation of the Medical Profession.

THE subject of the mobilisation of the medical profession came before a special meeting of the Panel Committee for the County of London on

Tuesday last, when a report submitted by the Finance and General Purposes Subcommittee was considered in detail. The report recognised the urgent necessity of providing additional officers for the Royal Army Medical Corps, its authors being convinced by confidential information which had been submitted to them that a large number of additional practitioners would be required for military service.

The very important resolution recently passed by the Central Medical War Committee with regard to mobilisation approved, it may be recollected, of the principle of mobilisation of the medical profession apart from any question of general mobilisation of the community. For the Central Medical War Committee desire that every individual whose name is on the Medical Register shall be held bound to give such service as he is competent to give when required to do so by the State. On this broad question of the mobilisation of the medical profession as an individual entity the Panel Committee for the County of London have made no pronouncement, but they consider that if such a proposal were carried into effect it is essential that the arrangements for mobilisation should be under the control of a purely professional committee. They find that the Central Medical War Committee, strengthened in certain directions, would be the most suitable body to undertake the important work. The recommendations of the Panel Committee provide accordingly for the addition to the Central Medical War Committee of "at least six practitioners actively engaged in panel practice, one of whom should be a woman," and they consider, further, that without serious interference with the medical needs of the civilian population much greater use could be made in the future of the part-time services of civilian doctors. Civilian doctors could, they hold, be advantageously employed in the treatment of sick and wounded soldiers whilst in hospitals, as well as for the discharge of other military duties at home. We are certain that the members of the Panel Committee for the County of London are well aware of the difficulties attached to this proposal, but it is the expression of a very general feeling, and one which we share ourselves. We believe that in this way an economy of personnel could be effected and more medical men found to meet the demands of the Director-General of the Army Medical Service.

We regret the recommendation of the Panel Committee that the members whom they desire to see added to the Central Medical War Committee should necessarily be engaged in panel practice. The probability, of course, is that those selected for the purpose would be in active panel practice, but it is perilous to attach conditions which might become hampering. The views of those in panel practice can be fairly stated by anyone really familiar with the circumstances, and it is conceivable that panel practitioners might by restricting their representation to one of themselves be deprived of the offices of a particularly good nominee.

Annotations.

"Ne quid nimis."

HEALTH OF THE PRISON POPULATION.

FEW people regard the prison as a health resort, but the contention that such is the case in prisons in this country would be made plausible by a perusal of the report of the Commissioners of Prisons which we publish in another column. The average death-rate in local prisons for the last 25 years has been less than 0·5 per 1000 receptions, and although for the year under review it is nearly 50 per cent. greater, the increase is entirely explainable by the altered age groups of the prison population. Prisoners of military age naturally are healthier and contribute less to the prison death-rate than do the older malefactors, and the actual number of prisoners of military age received in prisons has diminished to less than one-third in the last three years and entirely out of proportion to the reduction in older prisoners. The death-rate from natural causes in convict prisons is, of course, much higher: 6 per 1000 of the daily average population during the last ten years and 8 per 1000 for the year under review. No emphasis can here be laid on slight fluctuations as the total convict population is so small—under 2000, in fact, at the end of the year. No epidemic of infectious disease occurred during the year, and only 13 scattered cases in all; 3 each of enteric fever and erysipelas, the remainder being ordinary infectious fevers of a mild type. A comparative picture of prison life under less healthy conditions may be gained from Lieutenant-Colonel W. J. Buchanan's report for 1915 on the jails of the Bengal Presidency which has just come into our hands, and the comparison is not an unfair one in respect of numbers as the daily average number of prisoners is not widely different: 11,311 under the care of the English Commissioners, and 14,494 in Bengal, bearing in mind, however, that of the first number only about one-fifth are convicts, while of the Bengalese 97 per cent. are convicts. There is the initial striking fact that the death-rate amongst the Bengal convicts during 1915 was over 20 per 1000, being nearly three times the rate among convicts in the prisons of England and Wales. Of the 264 deaths among Bengal convicts in 1915, 77 were due to dysentery, 24 to malaria, 18 to diarrhœa, in addition to 38 from tuberculosis and 26 from pneumonia. Lieutenant-Colonel Buchanan, whilst attributing this melancholy death-rate largely to the very serious overcrowding in the prisons, remarks that in the district jail of Barisal the persistent care and attention given by the medical officers has resulted in practically stamping out dysentery from this jail, but he goes on to record the very serious mortality in Dinajpur which blots the year's administration. In this jail of 315 inmates there is a daily average sickness of 29 and a death-rate of 119 per 1000, 18 deaths during the year being due to dysentery, 2 to malaria, 4 to pneumonia, and 2 to diarrhœa. In regard to this jail Lieutenant-Colonel Buchanan writes: "I have urgently pressed on Government the great need of a hospital here. This jail is one of the worst of the East Bengal jails, and the medical officer has not a fair chance in treating the sick drawn from an unhealthy district in the present old barrack wards used as a hospital."

The standard of mental health of the prison population is not a high one for a variety of reasons. The English Prison Commissioners report the number of persons in local prisons found to be insane after reception as 103 (126) and in convict prisons 36 (26), the numbers in brackets being those for the previous year. Of the cases certified in local prisons three-fourths were regarded as already insane on reception and another 7 showed symptoms of insanity within a month of reception. The war has had a remarkable effect upon the prison mental standard on account of the absence, already noted, from the prisons of strong able-bodied men. The Commissioners record their belief that the country's call for men has appealed as strongly to the criminal as to other classes, and it is a remarkable fact that receptions to prison are now principally confined to the mentally as well as physically weak. The Commissioners express their regret at the paralysing influence which the deficiency of State accommodation has exerted on the treatment of criminal defectives, but they look forward to the cessation of hostilities rendering possible an efficient administration of the Mental Deficiency Act. The present method of dealing with the confirmed and hopeless inebriate also comes up again for censure.

THE PIG AS A FOOD MIDDLEMAN.

THE Local Government Board and the Board of Agriculture and Fisheries are concerning themselves with the necessity for increasing the food productions of the country by the development of pig, poultry, and rabbit breeding. In regard to the two latter, few hygienic or dietetic problems arise. But the recommendation to increase the number of pigs, and that not only in rural districts, where space is abundant and neighbours are distant, raises very different questions. The hygienic aspect is at once apparent, and has led to the existence in a number of urban districts, as well as in a few rural ones, of by-laws prohibiting the keeping of pigs within a prescribed distance of dwelling-houses. We learn, however, from a recent circular of the Local Government Board that a regulation is about to be made enabling any local authority to give permission for the keeping of pigs either generally or in particular cases, notwithstanding by-laws to the contrary. To those acquainted with the habits of the pig under favourable surroundings this relaxation will not appear unreasonable. The pigsty often smells not because of the pig, but because of the ignorance of his keeper. Provided with a small area for the purpose the pig will dispose of his excreta without any nuisance whatever and with incidental enrichment of the soil, while his sty remains cleanly. It is the wholly confined pig who stinks. But on the dietetic side, in recommending pig culture as an economical pastime the fact must not be lost sight of that the alimentary canal of the pig is adapted for much the same kind of food as the human child's. The pig has no highly developed cæcum to deal with the conversion of cellulose into digestible carbohydrates. The growing pig is a typical omnivore and ordinarily receives a large amount of nutritive material, some of which the growing child could well digest. Experiments have shown that viâ the pig as middleman only some 25 per cent. of the protein and some 45 per cent. of the total energy value of the food supplied him is ultimately returned to the consumer as pork or bacon. Brokerage of at least 55 per cent., which may well be largely exceeded, is charged by the pig. Pig culture can afford no excuse for wasteful housekeeping, and the presence in the pig-bucket of food which the family could have consumed is a disgrace to any patriotic housekeeper. The inspection of the amount of household waste might well become part of the sanitary inspector's routine duties at the present time. The case for pig keeping is more cogent where food refuse from hotels and institutions is in question. Food waste is apparently inseparable from civilised town life, and the pig may well be employed to redeem some of this waste if proper care is given to his lodging.

THE INTERNAL FORM OF HODGKIN'S DISEASE.

IN the *Journal of the Royal Army Medical Corps* Lieutenant T. H. Whittington has reported a case of the "internal" form of Hodgkin's disease of acute onset with relapsing pyrexia and signs and symptoms chiefly abdominal, which was very difficult of diagnosis and deceived the "very elect." A private, aged 19 years, was admitted to a base hospital from the trenches in Flanders on Nov. 21st, 1915. He looked pale and complained of pains in the soles, but nothing abnormal was seen in the feet. On the 24th the abdomen was distended, slightly tender all over, and rather rigid. The temperature ranged from 103° to 104° F.; the tongue was dry and brown. A leucocyte count showed a leucopenia of 3500. On the 27th he was sent to a hospital for infectious diseases as probably a case of enteric fever, and came under Lieutenant Whittington's care. He was very pale, with a rather "renal" appearance, and complained of headache. There was occasional muttering delirium with picking at the bedclothes. The pulse was very soft and occasionally dicrotic. There was marked tenderness with dullness on percussion in the left hypochondrium and left lumbar regions. This dullness appeared to be splenic, reaching down four finger-breadths below the umbilicus, but the spleen was not felt. The stools were fluid and yellow. No enlarged glands were felt. The serum reactions for the typhoid and paratyphoid bacilli were negative. The diagnoses so far suggested were acute peritonitis, recurrent appendicitis, and typhoid fever, the last being favoured. During the next week the abdominal distension diminished, enabling a firm and slightly tender spleen to be felt. The hæmoglobin was only 52 per cent. From Dec. 2nd to 5th the temperature fell and the patient rapidly improved. On the 31st he again became listless and pale, and complained of pains in the soles and toes. The temperature again rose and the spleen rapidly enlarged. The temperature soon fell, only to rise again on Jan. 4th, 1916, when the spleen was still more enlarged and the liver slightly so. Blood examination showed 3000 white and 3,600,000 red cells per c.mm. A differential count gave polymorphonuclears 80 per cent., lymphocytes 15, and large mononuclears 5. Several consultants saw the patient, and the diagnoses suggested were: a typhoid relapse, splenic anæmia, and tuberculous peritonitis, but Hodgkin's disease, Malta fever, kala-azar, congenital syphilis, and septicæmia were also discussed. He again improved, but another relapse followed, the abdomen being distended and showing free fluid in the flanks. There appeared to be an indefinite mass above the umbilicus. He became very emaciated and jaundiced,

and died on Feb. 15th, 12 weeks after the onset. At the necropsy much yellowish fluid was found in the abdomen. The spleen was thrice the normal size and hard and showed on its surface and on section yellowish-white spots. An enlarged gland in the portal fissure seemed to press on the hepatic duct. The retroperitoneal glands formed a large, irregularly lobulated, hard mass. Some enlarged glands were found below and behind the inner ends of the clavicles. Microscopic examination showed the typical appearance of Hodgkin's disease. In McNalty's study of "Lymphadenoma with Relapsing Pyrexia"[1] 8 cases out of 32 are described as without enlargement of the superficial glands. In only 2 of these was the duration shorter than in the present case. In a man, aged 23 years, the mediastinal glands, spleen, liver, and kidneys were affected and he died after five weeks. In the other the mesenteric and bronchial glands, liver, and spleen were affected, and death occurred after seven weeks. The other patients lived for periods varying from 4 to 15 months.

THE PARLIAMENTARY REPRESENTATION OF DUBLIN UNIVERSITY.

WE published last week a letter from the Professor of Anatomy and the Professor of the Practice of Medicine in Dublin University, urging upon those of our readers who are entitled to vote for the Parliamentary representation of the University to record their support at the forthcoming election in favour of Sir Robert Woods, M.D. Dub., who is standing as a non-party candidate. Sir Robert Woods approaches the electors with the plea that he is the representative of the medical faculty of the University, which is notoriously one of the most distinguished faculties, while Mr. Arthur W. Samuels belongs to the profession of law which, except in one solitary instance, has for half a century supplied the constituency with its Parliamentary member. The issue, in fact, is one to be decided between the profession of medicine and the profession of law, for both candidates disclaim party views in politics. Mr. Samuels describes himself as "a Unionist and Imperialist," with no reference to party interests. Sir Robert Woods is equally detached. In answer to a correspondent he has written: "I shall resist with all my power any attempt to revive the Irish controversy during the period of the war ..... and to coerce any section of the Irish people into a settlement which it does not desire. If, however, with the full and free consent of the Unionists of Ulster and the Unionist minority of Dublin and the South of Ireland, and with the full sanction of the Imperial Parliament, a real settlement of the Irish question is evolved, after the war, by the united statesmanship of both countries, I shall do my best to help it in every way." We wish Sir Robert Woods every success, because it is constantly brought home to us that the presence of more medical men in the House of Commons would be of great value to the country. The ignorance displayed by the majority of Members of Parliament upon all medical points is illustrated by the nature of the questions in the House of Commons no less than by the way in which medical, and indeed all scientific, interests are too often sacrificed to the interests of other sections of the community. At the Conference of Educational Associations held at the University of London last week Sir Alfred Keogh said it was a regrettable thing to find Cabinet Ministers, prominent administrators, and other people in high positions having no knowledge whatever of the elementary facts of science. He had to place scientific questions before these men, and he found it difficult to get low enough to reach their level. Every medical Member of Parliament helps to improve the situation, and from this point of view alone Sir Robert Woods may fairly expect votes.

[1] Quarterly Journal of Medicine, October, 1911.

OSTEOCHONDROMATOSIS OF JOINT CAPSULES.

IN 1900 Reichel published the first description of a rare condition characterised by the appearance of multiple osteochondromas in the capsules of one or more of the joints. Dr. J. W. Kopp[1] has recently recorded three new instances of this complaint, affecting the knee-joints in each patient, and he has found 11 others in medical literature. In 10 of the total of 14 patients the knees were involved; the ankle, wrist, elbow, hip, and metacarpophalangeal joint of the middle finger have also been found affected, each in different cases. In three patients, including one of Dr. Kopp's, both knee-joints were diseased; otherwise the osteochrondromatosis has apparently been confined to a single articulation. The disease may occur at any age, and although the new growths show no sign of malignancy they may recur after their operative removal, by arthrectomy or resection of the joint, has been attempted. This, no doubt, is a consequence of incomplete removal. In Reichel's case the patient was a man of 36 with a very chronic and almost painless affection of the knee. The joint was opened and a quantity of blood was removed from its cavity, together with two handfuls of loose cartilaginous fragments. Recovery followed; shortly afterwards Reichel opened the joint again and removed a number of loose, bluish-white cartilaginous fragments, but an attempt to dissect out the whole capsule of the joint, which was beset with numerous cartilaginous nodules of various sizes, was baffled by the discovery of similar nodules on the cruciate ligaments. Resection showed that the articular surfaces of the femur, tibia, and patella were unaffected, and that the new growths originated in the capsule of the joint. Dr. Kopp's first patient was a healthy student, aged 24, who came under observation in 1911 with a history of slight pains in the right knee for four years. The condition was attributed to trauma of an unusual character to which the attention of neurologists may be drawn—percussion of the patella with a percussor in a wanton moment during a joyous evening. The patient's gait was normal, but there were symptoms of the nipping of a foreign body in the joint. The joint itself showed an unsymmetrical swelling of the synovial membrane and the suprapatellar bursa, with fluctuation and limitation of movement to about 75°. Numerous free foreign bodies could be felt in it, and one, the size of a grape, lying on the inner side of the patella, could be moved two inches in any direction, but always returned to the same place, whence it was concluded that it had a peduncle. All the other joints seemed normal. This patient had had comparatively little trouble with his knee when he was seen again in 1914, and he refused operation; skiagrams were taken and are reproduced by Dr. Kopp in his paper. They show a curious dappling of most of the area subtended by the synovial membrane, but no changes in the structure of the bone or their articular surfaces. Dr. Kopp's second patient, a man of 39, gave a history of slight

[1] Nederl. Tijdschr. v. Geneeskunde, Amsterdam, 1916, ii., 1175.

trauma of the knee some 15 years before. Three years later he had had symptoms pointing to the nipping of a loose body in the joint. Dr. Kopp found swelling of the joint and suprapatellar bursa, and in both could be felt some movable and hard foreign bodies. The joint was opened under ether anæsthesia, and an incomplete arthrectomy was performed. Two free foreign bodies were found in the prepatellar bursa. The outer surface of the synovial membrane was found to be studded with bluish-white opalescent nodules, the largest as big as a pea. There was no evidence of inflammation and the synovial fluid was clear. Careful examination showed that these nodules arose from the synovial membrane only, and not from bone, cartilage, ligament, or muscle. The ends of the bones exhibited the appearances of arthritis deformans in its early stages. The patient made a good recovery from the operation, and was well satisfied with its results when he was seen again 20 months later. But a couple of foreign bodies could then be felt in the immediate vicinity of the right knee-joint, and Dr. Kopp concludes that it also was becoming affected with osteochondromatosis. The third patient was an old woman of 77 with senile dementia, who had foreign bodies in both knee-joints. Operation was not contemplated, but Dr. Kopp decided from the physical signs and skiagrams that he had here to do with a third case of this rare disease. Discussing its general diagnosis, he says that it has to be distinguished from osteoarthritis localised in some diverticulum of the joint, from the intra-articular exostosis cartilaginea first described by Volkmann in 1855, from arthritis deformans, and from the osteoarthropathies met with in tabes dorsalis and syringomyelia. As another possible source of confusion he mentions the fabella, a sesamoid bone appearing not rarely in the external head of the gastrocnemius. The pathogenesis of osteochondromatosis is uncertain. Reichel attributed it to infection; Lexer (1907) refers it to a developmental defect in the differentiation of the mesenchyma of the joint, comparable to that resulting in the growth of enchondromas about the bones of the fingers and toes. Dr. Kopp agrees with Lexer. The neoplasms removed from his second case were examined for him by Dr. de Josselin de Jong, who states that in this instance the nodules began life as minute osteomas in the capsule of the joint, and ended up as foreign bodies free in the joint, where they became covered with connective tissue and cartilage, while their bony core might develop into a calcareous mass. As for the treatment indicated, Dr. Kopp believes that recurrence is likely to follow arthrectomy or excision of the capsule of the joint, and that nothing short of resection of the whole joint will give a permanent cure.

SANITATION AND DISEASE IN BENGAL.

THE work of combating disease in India is rendered difficult by the indifference of the people to elementary hygienic precautions. The annual report for 1915 recently issued by the Sanitary Commissioner of Bengal illustrates this fact in a striking manner. The ravages of cholera in the Presidency during the year were very great, the number of deaths due to that disease being over 130,000, an increase of 41,000 on the total of 1914. The districts which suffered most severely were Mymensingh and Malda, and the high rate recorded is explained by the action of the people themselves. Dealing with Mymensingh, the civil surgeon writes: "In August, when a large part of the district was under water, dead bodies of cholera patients were, in two subdivisions of the district, thrown into the flood water, which spread the disease far and wide till the end of the year. These two subdivisions were responsible for 18,819 deaths out of a total of 26,662 in the whole district." This record is supplemented by the account given by the civil surgeon of what occurred in Malda. "From some of the bordering villages dead bodies were thrown into the river, and this contaminated the water and facilitated the spread of the disease to the villages situated on it." It is not surprising, in view of the facts we have cited, that the Sanitary Commissioner should declare that outbreaks of cholera must be counted as annual events so long as the majority of the sources of water-supply remain subject to gross contamination. But even where waterworks are installed and a pure supply is forthcoming the advantages thus afforded are not universally appreciated. Thus, at Berhampore, which has been provided with a pipe-supply, certain classes of the inhabitants persisted in drinking unfiltered water brought from the river, with the result that 74 deaths from cholera took place among them last year, while those who availed themselves of pipe-water remained immune to the disease. Bengal occupies the unhappy position of being the only part of India where the death-rate exceeded the birth-rate in 1915. The increase in mortality was largely due to cholera and small-pox, while the diminution in the birth-rate is ascribed to the deficiency in rainfall in 1914, which by preventing a decline in the prices of food grains affected the vitality of the poorer classes. The Government resolution on the Sanitary Commissioner's report expresses the opinion that the best prospect of permanent improvement in village sanitation lies in the widespread formation of union committees and the free exercise of their powers of local taxation. The Governor agrees with the Commissioner that much immediate improvement, which would also have an educative value, could be attained through the personal interest and initiative of district officials.

THE death is announced, at the age of 90, of Jean Baptiste Auguste Chauveau, professor of comparative pathology in the Paris Natural History Museum, and one of the most famous physiologists of his time.

A MEETING of the British Hospitals Association will be held at St. Bartholomew's Hospital, London, on Friday, Jan. 26th, at 3.30 P.M., when a paper will be read by Dr. W. J. Howarth, medical officer of health for the City of London, on the Treatment and Control of Venereal Diseases, with Special Reference to the Voluntary Hospitals. At the close of the proceedings the annual meeting of the association will be held to appoint officers for the ensuing year.

THE Royal Institute of Public Health has arranged an admirable series of public lectures on health problems under war and after-war conditions to be delivered every Wednesday afternoon at 4 P.M. from Jan. 17th to March 28th inclusive in the lecture room of the Institute at 37, Russell-square. Medical officers of health, medical practitioners, and all those engaged in public health and national services are invited to attend. The first lecture, on Wednesday next, will be delivered by Dr. Janet Lane-Claypon on Child Welfare Work, with Sir Robert Morant in the chair. Due notice of the other lectures will be given in the Diary.

THE LANCET, VOL. II., 1916: THE INDEX.

THE Index and Title-page to the volume of THE LANCET completed with the issue of Dec. 30th will be ready on Jan. 22nd. Owing to the continued shortage in the paper-supply, the Index will not be issued with all copies of THE LANCET, as was the custom prior to the War. Subscribers who bind up their numbers are requested to send a post-card to the Manager, THE LANCET Office, 423, Strand, London, W.C., when a copy of the Index and Title-page will be supplied free of charge.

PRISON COMMISSIONERS' REPORT.

THE report of the Commissioners of Prisons and the Directors of Convict Prisons for the year ended March 31st, 1916, which has been presented to Parliament, does not contain the usual report of the Medical Commissioners, this report, along with those of the visiting chaplain and surveyor, having been omitted on the recommendation of the Committee on Public Retrenchment. A number of paragraphs in the report itself, however, deal with medical topics.

Medical Matters Dealt with in the Report.

The death-rate in local prisons from natural causes was 0·77 per 1000 prisoners received, the average for the previous 25 years having been 0·49 per 1000. The death-rate from natural causes in convict prisons was 8·2 per 1000 of the daily average population, as compared with 6·1 for the past ten years. But this apparent rise in death-rate must be brought into relation with the great alteration in the age-groups of the prison population. An earlier paragraph explains the alteration thus:—

> The enlistment of many habitual petty offenders of military age can be inferred from the fact that for the year ended March 31st, 1914, the percentage of male prisoners of the age categories over 40 received on conviction formed 40 per cent. of the total population. For the year ended March 31st, 1916, this percentage had risen to 49, while the actual number of prisoners received of military age had fallen from 61,739 to 19,169 during these years.

The number of persons in local prisons found to be insane and certified as such after reception was 103, as compared with 126 last year, and in convict prisons 36, as compared with 26. Of the 103 cases certified in local prisons, 76 were found to be insane on reception and 7 exhibited symptoms of insanity within a month of reception. Many of those who were in prison for some time before the usual symptoms of insanity were observed were known to be of weak intellect or mentally impaired on reception, or to have been previously insane. As with the death-rate so with the incidence of insanity, the figures do not reflect the normal results of prison life.

The war has again had a marked effect on the average mental condition of the prison population, an effect which is described in the following interesting paragraph:—

> One of the notable effects of the war on the prison population has been that the receptions are now for the most part confined to the physically and mentally weak. The general standard of physique is now much inferior to that of prisoners admitted into prison in normal times, while the percentage of strong able-bodied men is comparativeiy small. There is every reason to believe that the country's call for men appealed as strongly to the criminal as to other classes, and if it had been possible to place under scrutiny every case admitted into prison within military age, there is little doubt but that the vast majority of cases would have been found to be physically unfit. A young burglar, one of a gang of five, told the chaplain of a London prison that his four pals had enlisted; two had been killed and two others wounded. He said he meant to go and "do his bit" as soon as he got out of prison—a promise which he faithfully observed.

The number of prisoners who were released from local prisons on medical grounds, exclusive of pregnancy, &c., but including 8 cases temporarily released under Section 17 (6) of the Criminal Justice Administration Act, 1914, was 31 and from convict prisons 2. There were 4 suicides in local prisons during the year and none in convict prisons. The daily average number of prisoners in hospital in local prisons was 361—225 males and 136 females—this being a proportion to the general prison population of 3·5 and 7·3 per cent. respectively. Thirteen cases of infectious disease were reported during the year—enteric fever, 3; erysipelas, 3; measles, 4; scarlet fever, 2; mumps, 1—as compared with 11 cases last year—viz., enteric fever, 1; chicken-pox, 2; scarlet fever, 2; diphtheria, 2; mumps, 1; and erysipelas, 3.

Mental Deficiency Act.—Convictions for Drunkenness.

As in the last year's report, allusion is again made to the difficulties which have arisen, owing to the outbreak of war and other causes, in the exercise of the Mental Deficiency Act so far as it relates to inmates of penal institutions. The Commissioners regard the record for the year under report as not an encouraging one. During the year 204 prisoners—130 males and 74 females—were certified under Section 1 of the Mental Deficiency Act, as compared with 248 last year. A large number of the 248 certified during 1914–15 have been received again, many several times, on re-conviction. Orders were made by the Secretary of State, under Section 9 of the Act, in 39 cases—10 males and 29 females—and these were removed to certified institutions, or, in the case of some of the females, to the Farmfield State Institution. In addition 28 males and 22 females were handed over to local authorities on discharge. The absence of institutional accommodation for defectives, and particularly State accommodation for males, exercises, in the Commissioners' view, a paralysing influence on operations under the Act as regards the disposal of criminal defectives. But a more hopeful note is struck for the future.

On the vexed question of the alleged increases of drunkenness among women much fresh light is thrown by an inquiry made by the Lady Inspector of Prisons into the character of the population committed for drunkenness to Holloway Prison.

The inquiry showed that during the three years 1913, 1914, and 1915, 10,888 committals on conviction of drunkenness were recorded against 1628 women, who, including the convictions incurred in years preceding 1913, had on their combined records a total of 30,986 convictions. Of these 1628 individual prisoners—

1092	were received in 1913, incurring that year					2768	convictions.
1045	"	"	1914	"	"	3931	"
813	"	"	1915	"	"	4189	"

The average convictions, therefore, per individual rose from 2·6 in the year 1913 to slightly over 5 in 1915. Amongst the 1628 women was selected a group of 25, who, at the end of 1915, had each received ten or more convictions for this offence. All are stated to have been first offenders in 1913 or 1914. By the end of 1915 they had amassed a total of 353 convictions—viz., 69 in 1913, 134 in 1914, and 150 in 1915. As regards first offenders in the drunkard class, the totals received in each year were 113, 113, and 37 respectively.

The inquiry at Holloway thus substantiated the observations of several governors and chaplains at other prisons—viz., that a falling population is at the present time contributing more convictions per annum than was the case before the war. If the average rate of convictions per annum incurred by each individual at Holloway Prison for the years 1913–14 and 1915–16 respectively be applied to the total receptions on convictions of drunkenness for the whole country, a result is arrived at which shows an actual falling-off of about two-thirds in the numbers received for this offence.

In connexion with this increased rate of convictions for drunkenness per individual the Commissioners comment on the curious fact that there should have been a great fall in the number of habitual drunkards committed to inebriate reformatories. So far as the metropolis is concerned, the numbers fell from 95 in 1913 to 9 in 1915. This is due in part to the war; but the failure of the Inebriates Act, 1898 to deal with the problem of habitual alcoholism must now, in the Commissioners' view, be admitted. The Commissioners sum up the matter thus: "If medical observation shows that mental causes enter into the history of the confirmed and hopeless inebriate, the Mental Deficiency Act now provides the opportunities for dealing otherwise with the repeated offence of drunkenness than by the useless, and, we might say, senseless, methods hitherto prevailing of repeated sentence to short terms of ordinary imprisonment. This affords no cure—perhaps only an encouragement. It is unscientific in principle, and further degrades the subject—man or woman."

KING EDWARD'S HOSPITAL FUND FOR LONDON.

A MEETING of the Governors and General Council of King Edward's Hospital Fund for London for the purpose of awarding grants to the hospitals, convalescent homes, and consumption sanatoria for 1916 was held on Dec. 15th at St. James's Palace, London.

Lord IVEAGH, who presided, read a letter from the King congratulating the Council of the Fund on the distribution of £170,000 this year, £30,000 more than last year's total, and £12,500 over the previous record achieved in the years just before the war. His Majesty also expressed the hope that the public would help to maintain this record.

Lord REVELSTOKE (the honorary treasurer) reported that the net receipts for the year to Dec. 11th, apart from receipts on capital account, had amounted to £269,526 18*s.* 6*d.* This included £100,000 cash received from Sir Walter Trower in respect of the residue of the estate of the late Isabella Countess of Wilton, and the Fund had already had transferred to it securities amounting to over £22,000. The Finance Committee were retaining the cash uninvested, so as not to hamper the discretion of the Council in deciding as to the use of the money in the event of any emergency.

Sir WILLIAM COLLINS, on behalf of the League of Mercy, said there was hardly any reason to doubt that the League would be in a position to make for the fourth year in succession a grant of at least £14,000 to the King Edward's Hospital Fund, and also to make a distribution of something like £3000 in the extra-metropolitan district

Sir WILLIAM CHURCH (the chairman of the Distribution Committee) presented a report which stated that the sum available for distribution amongst the London hospitals was £162,500, as against £133,500 in 1915. This was the largest sum that has ever been distributed by the Fund amongst the hospitals, being an increase of £29,000 over the last two years, and £11,500 over the previous maximum of £151,000 which was reached in the years immediately preceding the war. The increase in grants in aid of maintenance was £28,075, and became possible because of the postponement of building schemes and the reduction of grants towards capital expenditure. Of the capital grants of £19,075 recommended this year, only £6525 was on account of schemes begun since the outbreak of war on the ground of exceptional urgency; the balance had been devoted to relieving hospitals of capital liabilities incurred before the war. They had as far as possible distributed the increased grants in proportion to the probable urgency of need in 1916, and had given rather greater weight than usual to the more permanent elements which affected a hospital's power to stand increased financial strain, such as the relative amount of fixed income and the relative amount of available reserve funds; but the actual results of 1916 could not be taken into account until the next distribution. The number of hospitals applying for grants was 107, being three in excess of last year. The committee, Sir William Church continued, received yearly evidence of the increasing work done by the voluntary hospitals in the cure or prevention of disease in coöperation with State or municipal authorities, apart from the treatment of naval and military patients. This was one of the numerous ways in which the hospitals took their part in promoting public health. The latest development in this direction was the preparation by various hospitals of schemes for the treatment of venereal diseases in coöperation with the Local Government Board and the London County Council in accordance with the recommendations of the recent Royal Commission. In one case, that of the London Lock Hospital, an application for a capital grant in aid of sanitary and other improvements at the female hospital had been received, and in view of the importance of increasing the efficiency of this hospital in these respects the committee recommended a substantial grant towards the sanitary improvements. The committee further recommended that the Council which had already by large grants enabled the Male Lock Hospital to be brought thoroughly up to date, should also offer substantial assistance towards an approved scheme for the reconstruction of the Female Lock Hospital.

Mr. F. M. FRY then presented the list of awards which has already been published in the press. The largest individual grant, £15,000, has been given to the London Hospital, while Guy's Hospital follows with £9000. The smallest grants (£25) go to some of the cottage hospitals.

Dr. EDWIN FRESHFIELD (the chairman of the Convalescent Homes Committee) presented a report stating that the sum available for distribution amongst convalescent homes and consumption sanatoria was £7500, as against £6500 in 1915, the largest sum that had ever been placed at the disposal of the Convalescent Homes Committee. The number of applications eligible for consideration amounted to 42 from convalescent homes and 9 from consumption sanatoria, as against 41 and 9 respectively last year. The committee had made a slight increase this year in the number of beds reserved at consumption sanatoria for the use of patients in London hospitals, owing to the fact that certain women's beds no longer available had been replaced by children's beds. The accommodation thus secured amounted to 53 beds at six sanatoria.

The list of grants recommended by the Convalescent Homes Committee having been presented by Mr. J. G. GRIFFITHS,

Lord IVEAGH, in moving the adoption of the report and awards, said it was with great satisfaction that they found themselves able to make a record distribution, and this apart from supplementary grants rendered possible by the generosity of Sir Ernest Cassel. It was one of the functions of the Fund to serve as a steadying influence on the finances of the hospitals. The amount which the hospitals would get from the Fund in grants to maintenance, even in this record year, was only a little more than one-ninth of the total ordinary expenditure; while the very large increase in the maintenance grants would not cover the increase in their ordinary expenditure since the war began, reckoning only the year 1915. There was no doubt, moreover, that the need of the hospitals would continue to grow in the near future. The burden of 1916 would inevitably be greater, and if the Fund was to continue to do its part an increased distribution might become desirable. He wished to express the indebtedness of the Fund for the legacies of £20,000 received, under the will of the late Lady Brownlow, on the death of Sir Charles Brownlow, and £10,000 very kindly allocated to the Fund by the executors of the late Thomas Stephen Whitaker in the exercise of their discretionary power.

The Duke of NORFOLK having seconded the motion, the adoption of the reports was carried unanimously.

A meeting of the General Council of King Edward's Hospital Fund for London was held on Monday afternoon, Jan. 8th, at the offices of the Fund, 7, Walbrook, E.C. There were present the Speaker of the House of Commons (the Right Hon. James W. Lowther, M.P.), in the chair; the Earl of Bessborough; the Viscount Knutsford; Lord Burnham; Lord Somerlayton (honorary secretary); the President of the Royal College of Physicians (Dr. Frederick Taylor); the Right Hon. C. Stuart-Wortley, K.C., M.P.; Sir William S. Church, Bart.; Sir Owen Philipps, M.P.; Sir Horace Marshall; Mr. Frederick M. Fry (honorary secretary); Mr. John G. Griffiths (honorary secretary); Mr. Robert Fleming; Dr. Edwin Freshfield; Mr. W. J. H. Whittall. The appointments were announced of Mr. W. J. H. Whittall to the General Council and of Sir Edward Hope, K.C.B., to the Executive Committee. The resolutions providing for the work of the Fund for 1917, which were approved at the meeting of the Governors and General Council, were formally adopted.

MEDICINE AND THE LAW.

Humphreys v. *Miller, Rendell, and Harbord.*

IN this case, as will be remembered, it was shown that a lodging-house keeper let rooms to Mr. H. C. Miller, who resided there with his daughter until his death from leprosy, being attended in his last illness by Mr. E. A. Harbord. The plaintiff afterwards brought an action, tried by Mr. Justice Darling with a special jury, claiming damages against the executor of the deceased, his daughter, and Mr. Harbord, on the ground that there was an implied warranty when the rooms were taken that Mr. Miller was not suffering from any disease which would make it unfit or dangerous for him to occupy them or would prevent them from being in future let as furnished rooms; that Miss Miller knew that her father was not a fit person to occupy the rooms; and

that the father, the daughter, and Mr. Harbord concealed the fact from the plaintiff, in consequence of which the rooms were let. After a great deal of evidence had been given the jury returned answers in the plaintiff's favour to all the questions put to them, finding as facts that Mr. Miller when he took the rooms was liable to infect persons and furniture with leprosy, and that he and his daughter knew it; that the disease was communicable by infection or contagion in England; that Miss Miller and Mr. Harbord fraudulently misrepresented Mr. Miller as fit to occupy the rooms; that they concealed from the plaintiff that Mr. Miller was suffering from a disease which made him unfit and dangerous to occupy the rooms; that Mr. Harbord, acting as agent for the other two, stated that Mr. Miller was not suffering from any contagious or infectious disease, and that this was untrue, as he and Miss Miller knew; that all three conspired to conceal the state of Mr. Miller from the plaintiff, and made false statements with that object. Damages to the extent of £250 were awarded. Counsel for Mr. Harbord asked for judgment for his client *non obstante veredicto*, on the ground that there was no obligation upon him to disclose his patient's condition to the plaintiff and no evidence that he did not believe that in this country leprosy was neither infectious nor contagious. After further argument to the effect that there was no evidence to support the jury's findings, Mr. Justice Darling gave judgment for the defendants.

The Court of Appeal has since affirmed the decision of Mr. Justice Darling. Lord Justice Swinfen Eady held that there is no foundation in law for the argument that there is a warranty or condition that when a person takes furnished rooms he shall not be suffering from any disease which may be infectious or contagious; that there was no evidence that Miss Miller knew that her father was suffering from leprosy or from any infectious or contagious disease. With regard to Mr. Harbord, the evidence showed that he had nothing to do with the original taking of the rooms; he had told the landlady, when questioned by her, that the deceased was not suffering from an infectious disease, but had warned her to be careful, and that no one else was to use the lavatory used by the patient. According to the evidence, the risk of infection with leprosy in this country was practically *nil*, and that was Mr. Harbord's view. He honestly expressed the opinion that he held, and was under no obligation to divulge to the lodging-house keeper anything with regard to his patient. Moreover, the plaintiff could have determined the tenancy by giving a week's notice to her tenants. His lordship held that in view of the above Mr. Justice Darling was right in holding that there was no evidence upon which to base any finding which involved either of the defendants in liability to the plaintiff. Lord Justice Bankes, in concurring, said: "I see no evidence whatever on which it can be suggested as against this medical man that he did not honestly believe that, speaking practically, there was no danger either of infection or contagion from this particular disease." The appeal was therefore dismissed. That this case should have ended as it did, and that Mr. Justice Darling's judgment should have been upheld is eminently satisfactory, and the medical profession as well as Mr. Harbord is to be congratulated upon the result arrived at. The charge made in claiming damages was a charge of deliberate falsehood and conspiracy involving known danger to the health of innocent people for the convenience and in the interest of the medical man's patient. It is established that of all this there was no evidence. The fact that a case of leprosy was involved with the exposition of medical opinion as to this disease added incidental interest to the trial.

Coroners' Juries in War Time.

Three sane and useful suggestions have been made by Mr. S. Ingleby Oddie in a letter to the *Times* for economising money and men's time in connexion with inquests. He recommends that the coroner should be enabled by an Act of Parliament (1) to hold inquests without a jury, or (2) to hold them with a jury of seven, or (3) to order post-mortem examinations before deciding that an inquest is to be held. Of these it will probably be agreed by many that the adoption of numbers (1) and (3) not alternatively but simultaneously would be a useful innovation, and if such adoption were to be for the period of the war only, would constitute an experiment which need not be continued if it should prove unsuccessful. The third suggestion deals with a recommendation often made by coroners, which found strong support at the hands of the Departmental Committee on Coroners' Law in 1910. The first should be favourably considered by those who remember that many coroners are, and all might be, medical men with sufficient legal training for the performance of a coroner's duties so far as they entail knowledge of law. It may be pointed out that the economy of money, time, and man-power effected would be on a more important scale than that involved in the recent abolition of reports of certifying surgeons on accidents, which had a similar object in view. Also it would not involve injustice to anyone whose functions would be dispensed with, or any loss of protection to the persons on whose behalf they are now exercised.

The Slingsby Case.

In this case a declaration was claimed under the Legitimacy Declaration Act, 1858, with regard to the alleged child of Commander C. H. R. Slingsby. It will be remembered that Mr. Justice Bargrave Deane found that the child was borne by Mrs. Slingsby at San Francisco, the allegation on the other side being that he had been procured for her from another woman. The Court of Appeal held that the evidence did not justify the finding of Mr. Justice Bargrave Deane, and the appeal on behalf of the child to the House of Lords has now been dismissed. A curious feature of the case consisted in the calling in of Sir George Frampton, the well-known sculptor, to express an opinion upon the question of physical resemblance on the part of the child to the parents who claimed him as theirs. Sir George Frampton was of the opinion that a strong likeness existed, and the judge appears to have thought so too. As to this Lord Loreburn, in the House of Lords, expressed the opinion that Mr. Justice Bargrave Deane's views of the evidence must have unconsciously been influenced by Sir George Frampton, while Lord Sumner said that any weight that might be attached to likeness was overborne by other evidence.

PUBLIC HEALTH OF MANCHESTER.

IN his recently published annual report Dr. James Niven gives an instructive account of the health of the city of Manchester in the year 1915, and of the various preventive measures carried out under his direction, special reference being made to the administrative action taken locally for the control of tuberculosis. The appearance of this volume shortly after the issue of Dr. W. H. Hamer's report[1] for the same period affords opportunity for comparing the statistical records and sanitary defences of a well-equipped provincial city with corresponding data for the metropolis.

The "recorded death-rate" of Manchester was equal to 16·31 per 1000 at all ages, or 1·42 below the decennial average rate. The tabular records submitted are less complete than previously, and there is great doubt as to the total population of the city. Owing to the large number of enlistments, the age constitution of the civil population has seriously changed. Nor is this change confined to the male sex, since recent alterations of occupation have affected the distribution of women also. Either for reasons of economy, in war time, or else because of uncertainty attaching to population estimates, many of the usual tables are omitted in this report. But this omission has to some extent been compensated for by the Registrar-General, who publishes detailed periodical returns of mortality and of disease notification in each of the great British towns.[2]

The national records deal with the entire areas of the several towns, but in the present report essential particulars are given for each of the statistical divisions of the city. From these we learn that, as compared with the decennial average, the crude death-rate in 1915 shows a marked improvement in North Manchester and a considerable improvement in South Manchester, but a falling off in the old Manchester township. This supports the conclusion previously reached, that the poorer classes have suffered disproportionally in the last two years. Nevertheless, the average position of the Manchester working classes is believed to have improved, and there has been less pauperism in 1915 than in the two preceding years. In order to avoid

[1] THE LANCET, 1916, ii., 837.
[2] THE LANCET, 1916, ii., 1024

the uncertainty attaching to estimates of population, the actual deaths (in place of the death-rates) from the chief causes in the last three years are summarised in an instructive table. The most striking feature in this table is the great increase in the deaths from tuberculous phthisis and from heart disease in 1915, as compared with the year preceding the war. This abrupt rise, especially in the case of the first-named disease, may be due in part to the strain induced by war conditions and in part to the lack of new dwellings for the growing population. Balancing the gains and losses of life during 1915 in comparison with those in the previous ten years, the largest gains are found to be under the heads of pneumonia, whooping-cough, nervous disease, and diarrhœa. The losses are greatest under the heads of cancer, heart disease, and old age.

Infantile mortality.—Inasmuch as the mortality in the first year after birth is based, not on the numbers estimated to be living at that age, but on the number of infants born alive during the year, it is obviously unaffected by uncertainties as to population. It is also independent of the birth-rate. In the year under notice infant mortality in Manchester was at the rate of 129 per 1000 births, as compared with 112 in London, 117 in the 96 great towns, and 110 in England and Wales.[3] Infant mortality in the first three months of life was lower than in any previous years. It was also low in the second three months, but in the last half of the first year it was comparatively high. Compared with the preceding three years, we learn that during the first three months after birth proportionally fewer deaths occurred in 1915 from convulsions, premature birth, atrophy, and suffocation—i.e., from that class of disease which it is our main object to prevent. In the second three months the relation is less favourable. During the last half of the first year of life there were in 1915 relatively fewer deaths from whooping-cough, tuberculosis, and convulsions, but relatively more from measles, diphtheria, lung disease, and violence, the excess under lung disease being probably determined by measles prevalence.

Administrative Control of Pulmonary Tuberculosis.

Towards the close of last century a national movement was initiated for the suppression of tuberculosis. In a recent classical work[4] entitled "A Campaign against Consumption," by the late Dr. Arthur Ransome, then professor of public health in the Victoria University, the history of that movement was traced to its local origin half a century ago. The author asserts that the honour of being the first authority to suggest and eventually to adopt measures for the suppression of this scourge may fairly be claimed by Manchester. Dr. Ransome's own entrance into the campaign dates back to the year 1860, and to the establishment in Manchester and Salford of a weekly return of common diseases, prominent among which was phthisis. There is good reason to believe that these returns, voluntarily contributed by about 30 medical residents for more than 12 consecutive years, were not merely the forerunners but powerful incentives to the more complete notification returns which are now everywhere required under statute law. In 1884 a large area of old and dilapidated dwellings in Ancoats was officially condemned as unfit for human habitation. This area was supposed to afford shelter for 5600 persons of the poorest class, who on a five years average were succumbing to phthisis at the rate of 5·3 per 1000 living. The buildings on this area, and other insanitary areas in the older parts of the city have recently been demolished by the municipality, and better house accommodation has been provided for the displaced occupants

Notification of tuberculous phthisis.—Dr Niven will be recognised by his medical colleagues generally as one of the earliest among advocates of the compulsory notification of phthisis, as well as of its preventive treatment, as a matter of State policy. He is to be congratulated on the large measure of success he has achieved in Manchester in dealing with the administrative difficulties of the crusade—difficulties which were at one time regarded as insurmountable by many of his contemporaries. Systematic notification of phthisis is still on its trial in Manchester, London, and some other towns, and as local experience accumulates the results should materially influence administrative action. In the present report there appears a standard table showing the number of primary notifications during the year. This table is identical in form with that contained in Dr. Hamer's London report; and we may presume that the respective health officers will avail themselves of this and similar methods for the comparison of future results. The usual table showing the facts and rates of notification in the several districts has been prepared for 1915, but is not inserted in this report. The *notification-rate* exceeds the *death-rate* in various degrees. The case of Withington is especially notable. In this residential district the deaths steadily outnumber the reported cases, pointing to a failure in the duty of notification. The earliest records available respecting the results of notification are those for 1899—since which year more than 28,000 phthisical patients have been visited by the staff. In 25,000 cases sputum has been examined, with positive results in one-third of the cases. Not fewer than 27.106 of the patients have been isolated in hospital and the houses disinfected after removal of the patients.

The loss of life from phthisis in 1915 was in excess of the average. It was 1·76 per 1000 living of both sexes at all ages, and was above the mean rate in the preceding ten years by 0·09 per 1000. It was also above the rate in the County of London by 0·16 per 1000. When the total deaths in a single year are distributed over several age-groups in both sexes, the *rate of mortality* for each separate group cannot usefully be compared with corresponding rates for previous years. Nevertheless the *number of deaths* at each age may properly be compared, and thus an approximate idea of the course of events may be presented. By this means we learn that *among males* the phthisis deaths were more numerous in 1915 than in any of the preceding ten years. (This statement relates exclusively to the civil population, which includes Manchester soldiers discharged on account of phthisis.) The most marked increase occurs at ages 15–19, 20–24, and 35–74, but not at ages 25–34, nor at ages under 15. *Among females* also there is a corresponding excess in the deaths, the increase being nearly as great as among males. The greatest increase occurs at ages 25–34. It is possible that the additional stress of work now thrown on both sexes, and the inordinate demand for workers in the prime of life may account for the great addition to the death toll. When the deaths from bronchitis are examined similarly, they present parallel rises to those from phthisis, both among males and females. Pneumonia shows no such increase; on the contrary, among males the deaths thus returned in 1915 were fewer than in any of the preceding ten years. Among females they were fewer than in any of the ten except 1906.

Milk and tuberculosis.—The milk supply of Manchester is derived from about 69 farms, chiefly in the counties of Cheshire, Derbyshire, Staffordshire, and Lancashire. During the year 91 samples of milk were examined, and in a useful table the percentages are given of farmers in each county whose milk was found to cause tuberculosis. It is noteworthy that none of the farmers in Derbyshire or in Staffordshire sent tuberculous milk to the city. In Dr. Niven's report for 1913 particulars were given of the successful manner in which the work of keeping a herd of cows free from tuberculosis is being carried on. The milk produced by this herd is still supplied to the large fever hospital at Monsall and to the sanatorium at Baguley.

Poverty in relation to phthisis.—A most instructive table is inserted giving a classification of the cases whose family income fell short of a standard rate according to the ascertained "shortage," and showing the institutional assistance obtained for these patients. The standard was based on that given by Mr. B. Rowntree in his book on poverty. The table indicates under several headings the numbers living and the numbers dead at the end of 1915, the numbers admitted to the several hospitals, and the number receiving institutional assistance. It would appear from this table that in 1915 phthisis was more fatal to the poorer classes of cases than in previous years.

Report of the Tuberculosis Officer.

A valuable report by Dr. D P Sutherland is appended to that of the medical officer of health. It contains minute details of the manifold operations of his department in the course of the year. We can only briefly refer to the analysis of cases in which the results of institutional and dispensary treatment are shown. In the "residential

[3] See table on p. 41 of Registrar-General's return for the fourth quarter of 1915.

[4] Published in 1915 by the Cambridge University Press. Pp. 263. Price 10s. 6d.

department" 955 cases were treated in the several institutions, of which 505 were discharged "improved," 92 "without improvement," and 76 died. At the end of the year 221 cases remained under treatment. In the dispensary department 502 cases were treated, 212 of which were discharged as improved and 99 as without improvement, whilst 11 died. At the end of the year 132 patients still remained under treatment. Dr. Sutherland concludes his report with the encouraging statement that during the year 152 insured notified cases were found to have so far recovered that no evidence of active tuberculosis could be demonstrated; these are therefore to be regarded as arrested cases. They will, however, still remain under observation, and their health and working capacity will be reported upon periodically.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Annual Report of the Local Government Board for Ireland.

THE annual report of the Local Government Board for the year ending March 31st, 1916, is a slim pamphlet of some 60 pages instead of the portly volume to which we have been accustomed. This economy of paper and printing has been effected by the omission of the multitudinous tables and returns which used to appear as appendices to the report proper. The tables, though not published, have been prepared as usual, and are available for reference. The figures relative to poor-relief show a rising improvement. The numbers in workhouses, including sick, aged and infirm, lunatics, idiots and imbeciles, have decreased markedly, while the numbers in the extern institutions, and more especially those receiving outdoor relief, have diminished both individually and in the aggregate. In the workhouses the deaths have decreased by 581 on the number of the previous year, and the total number of deaths from tuberculosis have decreased by 167, thus keeping up the record of diminution which has existed without a break since 1912. The deaths of infants show a decrease of 272. A graceful tribute is paid in the report to the large number of medical officers who have volunteered for service with the forces of the Crown, while the difficulty of finding adequate assistance in caring and attending on the sick poor is also commented on. The notification of tuberculosis is being gradually extended, and some local bodies have passed resolutions in favour of the general introduction of the system. The report announces with regret that "notification is not infrequently delayed until a late stage in the disease," and asks that care should be taken in all cases to notify before the infection has reached an advanced stage. Unfortunately, the Local Government Board ignores that under the conditions prescribed by the Board itself for the notification of tuberculosis it is only rarely that it is legal to notify the disease in the early stages. A medical man notifying the disease except under the prescribed conditions would leave himself open to an action for damages. In speaking of its care of the Belgian refugees thanks are given to the medical men and the hospitals of Dublin for the free advice and treatment rendered during the year.

Doctors of Military Age in Ireland.

The legal adviser of the Irish Local Government Board, Dr. Vanston, K.C., has given his opinion that the Board had an absolute discretion, under Section 8 of the Act, 14 and 15 Vict., cap. 68, to refuse their approval, as they thought proper, for any reason, or without giving any reason, to the appointment of a medical officer of a dispensary district made pursuant to statute by a board of guardians. Further, Dr. Vanston states that the Letterkenny board of guardians have no power to remove Dr. Walker from the office of temporary medical officer by passing the resolution of Sept. 8th, 1916, which was *ultra vires* and of no legal effect. In the face of these facts, communicated by the Local Government Board, the Letterkenny board of guardians, by a motion passed by a majority at their last weekly meeting, have decided to instruct their solicitor to take the necessary proceedings to compel the Local Government Board to sanction Dr. J. P. McGinley's appointment.[1]

[1] See THE LANCET, 1916, ii., 497.

Infectious Diseases in Ireland.

The following table in regard to infectious diseases in Ireland appeared in one of the Belfast papers of Dec. 28th, 1916. These are notifications:—

	Dublin.						*Belfast.*				
Week ending—	Scarlet fever.	Diphtheria.	Enteric fever.	Erysipelas.	Total notifications.	Week ending—	Scarlet fever.	Diphtheria.	Enteric fever.	Erysipelas.	Total notifications.
Nov. 18th ...	8	3	8	1	25	Nov. 18th ...	22	4	9	7	43
Nov. 25th ...	5	1	6	3	24	Nov. 25th ...	10	5	6	4	25
Dec. 2nd ...	7	3	2	0	20	Dec. 2nd ...	15	4	4	3	26
Dec. 16th ...	3	3	2	3	15	Dec. 16th ...	14	3	5	5	28
Total ...	23	10	18	7	84	Total ...	61	16	24	19	122

The disease "tuberculous phthisis" is now omitted. The anomalous figures under this heading were made the subject of comment in THE LANCET, when it was pointed out that, while only a few cases of phthisis were, as a rule, notified in Belfast, quite a number of notifications appeared in the Dublin list. The explanation, if such it can be called, is said to be the difficulty of notification in Ireland, to which allusion has been made. The disappearance of the figures from the official table does not lessen the difficulty.

Jan. 8th.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

To be temporary Surgeons: A. Orr-Ewing and R. Cripps.

Surg. J. R. Haldane is placed on the Retired List.

ARMY MEDICAL SERVICES.

TERRITORIAL FORCE.

Capt. A. N. S. Carmichael, from attached to Units other than Medical Units, to be Deputy Assistant Director of Medical Services.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. E. Brodribb is restored to the establishment.

To be temporary Lieutenant-Colonels: Col. V. Matthews, late R.A.M.C. (Vols.), whilst specially employed; and H. M. Rigby (Capt. R.A.M.C., T.F.).

W. E. Home, Fleet Surgeon, R.N. (ret.), to be temporary Major.

To be temporary Honorary Majors: R. Armstrong-Jones and E. W. White.

To be temporary Captains: Temp. Lieut. F. W. H. Hutchinson, C. G. Whorlow, R. Williams and C. H. Treadgold.

To be Lieutenant: B. Mountain.

To be temporary Lieutenants: J. K. Watson, C. D. H. Corbett, A. R. Goldie, H. H. Fairfax, S. G. J. Dowling, A. C. S. Waters, E. H. White, F. C. Sprawson, F. Simpson, W. P. Gibb, C. M. Atkinson, A. G. Macdonald, A. B. McMaster, F. Challans, C. E. Tangye, P. J. O'Sullivan, P. A. Leighton, M. E. A. Wallis, R. O. Whyte, L. B. C. Trotter, I. G. Cobb, C. K. Smith, J. H. Mayston, H. Freeth, A. Leitch, J. Young, M. H. Raper, T. H. Macfie, B. A. Slocombe, M. Henry, C. L. Williams, and H. G. Peel.

Temporary Captains relinquishing their commissions: J. Burfield, R. J. Jones, and T. F. Weakliam (on account of ill-health).

Lieutenants relinquishing their commissions: F. J. R. Forster, J. D. Shields, V. K. O'Gorman, and M. F. Hession.

TERRITORIAL FORCE.

Capt. B. Robertshaw, from a Field Ambulance, to be Captain.

Capt. H. M. Rigby, Capt. E. D. Macnamara, and Capt. A. D. Reid are seconded whilst holding temporary commissions in the R.A.M.C.

Capt. J. M. Hunt to be temporary Major.

Capt. H. G. F. Dawson to be Major.

Lieutenants to be Captains: F. F. T. Hare, S. Child, and C. P. Sells.

Capt. (temp. Major) J. E. W. Mac Fall relinquishes his temporary rank on ceasing to command a Field Ambulance.

Capt. (temp. Major) J. Young to be temporary Lieutenant-Colonel whilst commanding a Field Ambulance.

Lieut.-Col. F. J. Knowles, from Territorial Force Reserve, to be Lieutenant-Colonel, without pay or allowances.

Capt. F. B. Smith, from a Field Ambulance, to be Captain.

Lieut. J. C. Newman to be Captain.

Captains relinquishing their commissions: R. P. Dawes, W. H. Calvert, and B. S. Wills.

TERRITORIAL FORCE RESERVE.

Capt. W. N. W. West-Watson, from a casualty clearing station, to be Captain.

SPECIAL RESERVE OF OFFICERS.

Lieut. (on probation) R. R. Scott is confirmed in his rank.

INDIAN MEDICAL SERVICE.

Temporary Lieutenants to be temporary Captains: Kamberanda Kariapa Mandara and Jehangir Kaikhusro Nariman.

The retirement of Capt. Jogesh Chandra Dey has been confirmed by the King.

Col. W. W. Clemesha, Sanitary Commissioner with the Government of India, is at present working temporarily as health officer of Delhi, pending the arrival of a permanent incumbent.

DEATHS IN THE SERVICES.

Surgeon-General Sir Edmond Townsend, K.C.B., C.M.G., A.M.S., on Jan. 3rd, at his residence, Clontymon, Co. Cork, aged 71, after a long record of active service. He entered the Army in 1867 and served in the Abyssinian campaign 1867–68 (medal), in the Malay Peninsula 1875–76, where he was severely wounded (medal with clasp), and in the Zulu war, where he was present at the battle of Alundi in 1879 (mentioned in despatches). He also served in the Egyptian war of 1882, including Kassassin, Tel-el-Kebir (medal with clasp and Khedive's Star), in the Burmese Expedition 1885–86 (medal with clasp), and in the Ashanti Expedition (mentioned in despatches and star). He was with the forces in the North-Western Frontier of India campaign 1897–98. Principal Medical Officer with the Mohmund Field Force and Principal Medical Officer with the 1st Division in the Tirah Expeditionary Force (mentioned in despatches, C.B., and medal with two clasps). In the South African war of 1899–1902 he was Principal Medical Officer with the 1st Division and afterwards in the Western District (dangerously wounded, mentioned in despatches, C.M.G., Queen's medal with four clasps, and King's medal with two clasps). From 1902 till his retirement from the service in 1905 he was Principal Medical Officer at Netley

VITAL STATISTICS.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns 969 births and 872 deaths were registered during the week ended Saturday, Dec. 30th, 1916. The annual rate of mortality, which had increased from 13·8 to 19·6 per 1000 in the four preceding weeks, fell to 19·2 per 1000 in the week under notice. During the 13 weeks of last quarter the mean annual death-rate in these towns averaged 15·3, against 15·6 per 1000 in the large English towns. Among the several towns the death-rate during the week ranged from 9·3 in Ayr, 11·4 in Leith, and 13·7 in Clydebank, to 23·0 in Perth, 26·7 in Hamilton, and 26·9 in Dundee.

The 872 deaths from all causes were 20 fewer than the number in the previous week, and included 50 which were referred to the principal epidemic diseases, against 37 and 46 in the two preceding weeks. Of these 50 deaths, 13 resulted from infantile diarrhœal diseases, 11 each from whooping-cough and diphtheria, 10 from measles, 3 from scarlet fever, and 2 from enteric fever. The annual death-rate from these diseases was equal to 1·1, against 0·7 per 1000 in the large English towns. The deaths from infantile diarrhœa, which had been 14, 10, and 9 in the three preceding weeks, rose to 13, of which 9 occurred in Glasgow. The deaths referred to diphtheria, which had been 6, 3, and 6 in the three preceding weeks, rose to 11, and included 4 in Glasgow and 2 each in Edinburgh and Dundee. The fatal cases of whooping-cough, which had been 3, 7, and 12 in the three preceding weeks, numbered 11, and comprised 4 in Glasgow, 3 in Edinburgh, and 2 in Leith. The deaths attributed to measles, which had been 12, 11, and 14 in the three preceding weeks, fell to 10, of which 8 occurred in Dundee. The 3 deaths from scarlet fever were slightly below the average in the earlier weeks of the quarter. The 2 fatal cases of enteric fever occurred in Glasgow.

The deaths referred to diseases of the respiratory system, which had increased from 118 to 227 in the four preceding weeks, further rose to 240 in the week under notice, and were 85 above the number registered in the corresponding week of 1915. The deaths from violence numbered 27, against 34 and 33 in the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the registration area of Dublin 130 births and 216 deaths were registered during the week ended Saturday, Dec. 30th, 1916. The annual rate of mortality, which had increased from 17·7 to 25·6 per 1000 in the four preceding weeks, further rose to 28·4 in the week under notice, against 23·7 per 1000 in London.

The 216 deaths from all causes included 24 of infants under 1 year and 73 of persons aged 65 years and upwards. Five deaths were referred to infantile diarrhœa, 4 to measles, 2 to whooping-cough, and 1 to scarlet fever. The causes of 19 deaths were uncertified, and those of 9 others were the subject of coroners' inquests, while 79, or 37 per cent., of the total deaths occurred in public institutions.

During the same period 133 births and 159 deaths were registered in the city of Belfast. The deaths corresponded to an annual rate of 21·3 per 1000, and included 14 of infants under 1 year and 52 of persons aged 65 years and upwards. Two deaths were referred to infantile diarrhœa and 1 each to measles and diphtheria. The causes of 5 deaths were uncertified, 8 inquests were held, and 38 of the total deaths occurred in public institutions.

RUSSIAN MEDICAL SCHOLARSHIPS.—The director of the Higher Institute of Medicine for Women at Petrograd has received an anonymous gift of £20,000 for the foundation of scholarships in the name of Count Vorontzoff, who died last year.

CENTENARIANS.—Mrs. Elizabeth Symons, of Church Town, Crowan, died recently, aged 102 years and 10 months. She is stated to have been the oldest person in Cornwall.—Mr. Samuel Stidwill, of 6, Union-street, Stonehouse, Plymouth, died on Dec. 26th, 1916, aged 102 years.—Mrs. Harriet Godland died recently at an almshouse in Ilton, Dorset, in her 104th year.—Mrs. Mary M'Quade, Omeath, S. Louth, died on Jan. 4th at the remarkable age of 110 years. She spoke English and Irish fluently, and is said to have been the oldest woman in Ireland. She resided all her life at Omeath, and her age has—it is stated in the papers—been verified by church records.

Correspondence.

"Audi alteram partem."

THE LIQUOR TRAFFIC AND THE FOOD QUESTION.

To the Editor of THE LANCET.

SIR,—In your leading article under this title you comment on the effect of the regulations of the Liquor Control Board in decreasing drunkenness and alcoholic disease as measured by the most characteristic manifestation of alcoholism, delirium tremens. In the report of the Liquor Control Board, issued a few days ago, statistics are given which show a reduction in the number of female convictions for drunkenness of 43·8 per cent. in England and 37·7 per cent. in Scotland, and the Board regards these figures as effectively disproving the common assertion that, while drunkenness among men may have diminished, it has increased among women. My experience as physician-in-charge of the alcoholic wards in the Royal Infirmary, Edinburgh, leads me to believe that there is an important fallacy in the data founded on; and it is in the public interest at the present time that attention should be drawn to it.

During the past year there has been a very unusual strain on the wards in question, and more especially for female patients. The number of patients suffering from acute alcoholism—nearly all brought in by the police—who were sufficiently ill to necessitate their being treated as in-patients was double the average of previous years. The accompanying table shows the record for admission of men and women, and also the number of women arrested for drunkenness during the same period:—

	Admissions to wards.		Arrests for drunkenness.
	Males.	Females.	Females.
1913	198	52	1719
1914	185	51	1961
1915	169	53	1721
1916	151	108	1222

This increase in alcoholic cases is confirmed in the experience of the out-patient department of the hospital, where less serious cases are treated for injuries received under the influence of liquor; statistics on this point are not, however, available, as the patients are classified according to the surgical conditions.

We have, therefore, an anomalous position, the experience of the hospital pointing conclusively to a marked increase of alcoholism among women; the statistics of the police under the headings of "Convictions for Drunkenness" and "Arrest for Drunkenness" pointing in the opposite direction.

If the experience in Edinburgh can be taken as an index of conditions obtaining elsewhere, it seems clear that the Liquor Control Board is hardly justified in the conclusion it has drawn from the data supplied by the police reports. I am aware that in former reports the Liquor Control Board has given statistics in regard to admissions for delirium tremens, mostly, I think, in English hospitals. In this connexion it is important to keep in mind that, in Scotland at any rate, only a proportion, and a small one, of cases of acute alcoholism come into the category of delirium tremens.

I am, Sir, yours faithfully,

Edinburgh, Jan. 8th, 1917. CHALMERS WATSON, M.D. Edin.

*** The curious discrepancy to which Dr. Chalmers Watson calls attention is explained by the Prison Commissioners, to whose report we allude in another column. Fewer women have been convicted of drunkenness, but the average number of convictions per individual has risen to such an extent as actually to increase the total number of convictions.—ED. L.

To the Editor of THE LANCET.

SIR,—I have read the leading article on the liquor traffic and the food question, in which you comment adversely on total prohibition. In the first place you say its enforcement would not be easy. Why not? If the conscription of our

sons has been attained, why not the conscription of our luxuries? It is the easiest and only way of solving the liquor question; all else is mere tinkering with the evil. Secondly, you put up a problematical case of evil resulting from the sudden cessation of alcohol, especially in elderly men who have been accustomed to it, and dwell on the possibility of restricted output on this account. This theoretical diminution, which I dispute, would be a mere drop in the bucket compared to the actual diminution which is at present going on in munition works from over-indulgence in alcohol by workers who carry it in, and find opportunities to consume it at their work. Prohibition would undoubtedly vastly increase the output of war munitions, at least, in Glasgow and Clyde district. Your third argument against prohibition is the use of other substances—methylated spirit, varnish, lacquer, and the poisonous effects on those who drink them. Why should we distress ourselves about these degenerates who will not deny their appetites? Is it for the protection and preservation of this portion of our race that we are sending our sons into battle?

Your alternative to prohibition of imposing restrictions in the hours of sale and quality of liquor as advocated by the Liquor Control Board has been a complete failure in Scotland. In to-day's *Glasgow Herald* an Edinburgh doctor gives statistics showing that in the Royal Infirmary there the number of acute alcoholic cases admitted to the female ward was twice as great as in 1913–14, although the convictions for drunkenness in the police courts had fallen by 500. A publican patient of mine tells me that he is quite satisfied with the restricted hours of sale as he is selling a half more liquor than before it with less labour and expense. The long queues of women seen in Glasgow lately waiting to get bottles filled before the New Year closing days show the utter futility of these restrictions, and the after-results are seen in our own Royal Infirmary, where probably one-half of the surgical cases are the direct result of alcoholic indulgence. When you know of women admitted there this week with their faces trampled on by drunken husbands and another jumping out a second-storey window to escape from the violence of a drunken madman you can only conclude that the total prohibition of alcohol is the only efficient way.

If a new disease were to make its appearance in the land bringing in its train one tithe of the wastage and suffering to innocent people that alcohol does it would not be tolerated for a moment. State ownership would not cure the drinking habits of Scotland—they don't care who owns the public-house, their object is to get enough to make them feel the effects of the alcohol. Till we as a nation get a Government that will help us to purge ourselves from our national sins we cannot hope, nor do we deserve, to win the war.

I am, Sir, yours faithfully,

JAMES DUNLOP, M.B., C.M. Glasg.

Glasgow, Jan. 6th, 1917.

*** No one controverts much of what Dr. Dunlop says. It is common knowledge. The enforcement of prohibition, on which we did not comment adversely, is difficult, because a vested interest, subject to good conduct, has been recently conferred upon owners of licensed properties. The actual circumstances have to be looked at, lest in the search for what may later be the best we lose the present good.—ED. L.

AGGLUTINATION REACTIONS IN TYPHOID AND PARATYPHOID FEVERS.

To the Editor of THE LANCET.

SIR,—It would appear from recent publications that Dreyer, Ainley Walker, and Gibson are of opinion that they were the first to realise the fact that repeated agglutination tests are necessary before arriving at a definite diagnosis in cases of the enteric group in inoculated men.

In a paper published by them in THE LANCET, 1915, i., 324, they made the following statement when dealing with this subject:—

It is probable that the absence of accurate diagnosis in the past explains the fact that statistical results arrived at in our Army have not always been so convincing as would otherwise have been the case.

The above remark is quite untrue of later years and an injustice to officers of the Royal Army Medical Corps.

I feel that it is only right to point out that repeated observations by the macroscopic method of the serum agglutinin content in cases of suspected typhoid and paratyphoid fevers have been taught at the Royal Army Medical College, and carried out by Army bacteriologists since the re-introduction of typhoid inoculation in the Army in 1905.

The necessity for using Dreyer's technique to arrive at reliable results, as suggested in a paper by Ainley Walker in THE LANCET of Nov. 25th, 1916, is not apparent, and equally reliable results can be and have been obtained when using a living suspension of bacilli, provided the suspension is standardised.

The following extracts will show that repeated observations were found to be necessary in past years, and it will be noted that these extracts are from reports and papers published some time before the appearance of papers by Dreyer, Ainley Walker, and Gibson; in fact, before they had probably had very many opportunities of noting the serum reactions in inoculated individuals suffering from fevers of the enteric group, especially in the case of paratyphoid A fever, which rarely found its way west of Suez before this war.

The first is from an abstract of report on the enteric fever depôt at Naini Tal, taken from the annual reports of divisional sanitary officers in India for 1908, published in 1909.

Some of these errors in diagnosis are due to the fact that the men had been inoculated, and therefore their blood gave a positive Widal reaction, and they were diagnosed enteric fever on the strength of this alone. In all cases of fever in inoculated men the blood should be taken near the beginning and towards the end of the fever. If the two results are the same the case is probably not enteric. If there is a marked rise in the agglutination titre the case is certainly one of enteric fever. Every case of true enteric fever should give a complete reaction in a dilution of 1/100 at some period of the disease. In the case-sheets of many of the men sent here it is noted "Widal reaction 1/40." Now nearly all inoculated men will give a positive reaction in this dilution for months and in some cases for years after inoculation.

Again, in the 1910 report from the same depôt we find the following:—

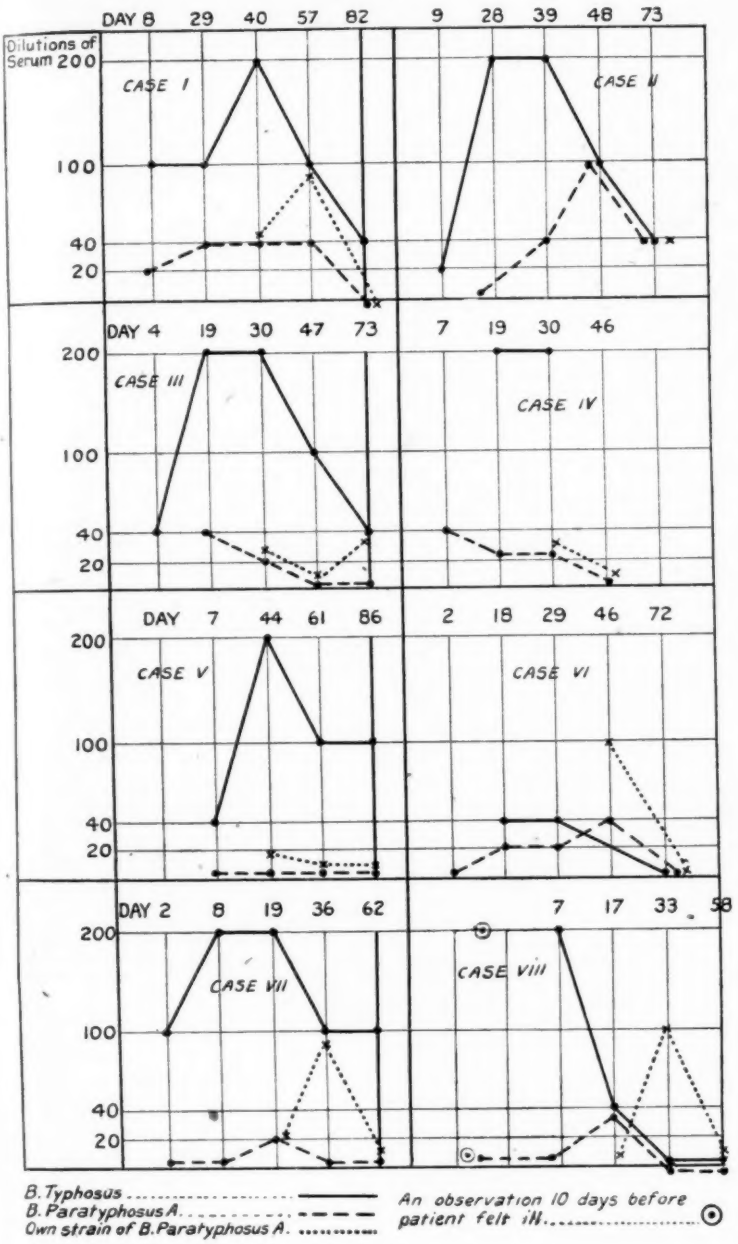
In paratyphoid fever the Widal reaction is invariably raised for the *B. typhosus*, especially during the first week of fever, and may be just as high for this bacillus as that shown during an attack of ordinary enteric fever. The reaction for para. A is as a rule lower and may only be present in such dilutions as 1/20 and 1/40 and possibly only a trace in the latter; it is also as a rule transient and may only be found for a few days in the later stages of the disease or early days of convalescence, and as a rule disappears in a few weeks, although in some cases we have found it a year after the fever. The group agglutinins for typhoid also disappear rapidly in contrast to the specific agglutinins after an attack of true typhoid fever, which remain raised for months and years in some cases. Thus we have the apparent anomaly of a man passing through a fairly severe attack of enteric fever (clinically) and giving a few weeks later an entirely negative reaction. This has happened here in several cases from whose blood the *B. para. A* had been isolated and whose agglutination titre had (during the fever) been high for both typhoid and para. A. In some cases, also, the paratyphoid reaction may entirely disappear, leaving a raised titre for *B. typhosus*, and again very rarely the titre for paratyphoid may remain raised without any agglutinins for *B. typhosus*.

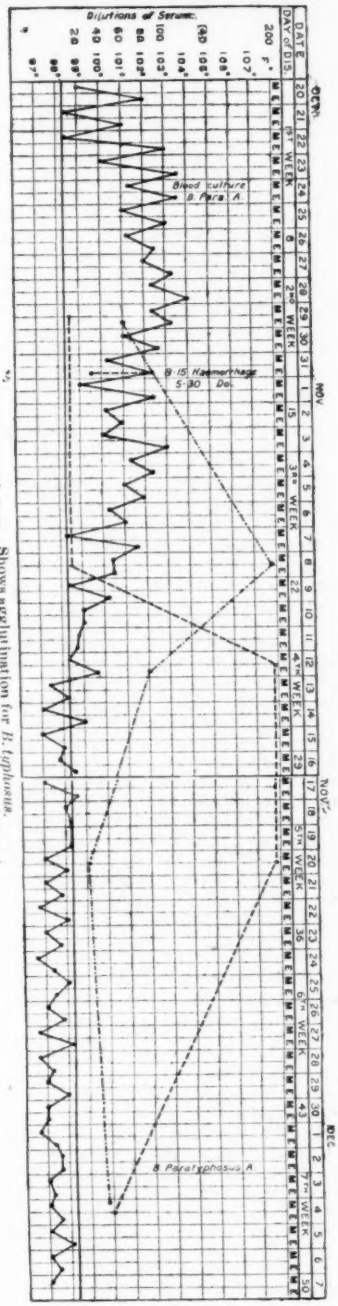
An article published in the *Journal of the Royal Army Medical Corps* also points to the fact that army bacteriologists were quite alive to the importance of repeated Widal estimations in 1910. The paper referred to is "An Inquiry into a Small Epidemic of Paratyphoid Fever in a Camp in India," by Major H. W. Grattan, R.A.M.C., and Major D. Harvey, R.A.M.C.[1] In this epidemic all the men who contracted the fever were inoculated against *B. typhosus*, and it is interesting to note that the bacillus was recovered from the blood in every case but one. The charts of the agglutination curves were published and are here reproduced. (See Chart I.)

To take another example. Chart II. is from a paper published in the *Journal of the Royal Army Medical Corps*, 1911, xvii., showing agglutination curves in a case of

[1] Journal of the Royal Army Medical Corps, 1911, xvi., 9.

CHART I.





Shows agglutination for *B. typhosus*.
Shows agglutination for *B. paratyphosus A*.

CHART II.

paratyphoid A fever occurring in a man inoculated against *B. typhosus*.

This paper by Major H. W. Grattan, R.A.M.C., and Captain J. L. Wood, R.A.M.C., gives an excellent account of the serum reactions of cases of paratyphoid A fever in inoculated men, and also mentions the frequency of the low titre of the serum for para. A. This point Professor Dreyer laid stress on at a meeting of the Royal Society of Medicine on Nov. 9th, 1915. His words at the meeting were :—

..... In every case bacteriologically proved to be a typhoid or paratyphoid B infection, the agglutination method gave a positive diagnosis (i.e., 100 per cent. of the cases), while in the case of paratyphoid A infection the agglutination test failed in only about 7 per cent. of the cases. Why are the results with paratyphoid A relatively so poor? The reason is that for a considerable time I did not know how low is the agglutination given by paratyphoid A in certain cases.

This in the year 1915, and after he had been working with the two officers mentioned above, while all of the papers referred to in this communication were published before the end of 1911. The evidence brought forward will, I think, establish the fact that bacteriologists in the service were not quite so behindhand in the bacteriology of the enteric group of fevers as Drs. Dreyer, Ainley Walker, and Gibson would lead us to believe.

I am, Sir, yours faithfully,

H. GRAEME GIBSON,
Captain, R.A.M.C.

Royal Army Medical College, Dec. 30th, 1916.

THE NOMENCLATURE OF "INTERNAL SECRETION."

To the Editor of THE LANCET.

SIR,—Dr. Blair Bell, in his letter in your issue of Jan. 6th, censures me for employing the term "endocrine organs" to denote organs of internal secretion. I am, however, in no way responsible for this term, as Dr. Blair Bell seems to suppose, although I think it convenient. It has for some time been in general use, and appears to have come to stay. Whether such a word as "endocrine" could be properly coined in Greek is beside the question. What is certain is that it expresses what is wanted to be expressed—viz., the process of internal secretion, by a simple word, which, whatever it might be in Greek, is good enough English, and has a familiar example in "endogen" to support it. I am afraid many scientific terms used in medicine are not defensible on purely etymological grounds, yet quite well serve their purpose. The term "endocrine" is at any rate hardly likely to be superseded by "endocritic," which Dr. Blair Bell "has been in the habit of using" in its place; for apart from the fact that it is damned with very faint praise by the author of its being, who himself considers it "a poor word," it suggests to a physiologist the antithesis of "epicritic," which Head and Rivers have employed in a totally different connexion.

As for the word "hormopoietic," which Dr. Blair Bell now proposes we shall adopt in place of "endocritic," and regarding which he states that "the derivation is obvious and, he thinks, unassailable," a glance at a lexicon shows that this can only be derived from ὅρμος, a chain or cord, so that the internally secreting organs thus become either "chain-factories" or "rope-walks," which, as old Euclid used to say, is absurd!

Regarding the term "hormone," I have given the history of this at length in my book on the "Endocrine Organs," published last year. If Dr. Blair Bell had looked at this or had consulted the original papers referred to in it he would have avoided more than one error. Professor Starling, who coined the word, and who, as Dr. Blair Bell says, "is entitled to define his own term," has given a very precise definition of it[1]—viz: "By the term 'hormone' I understand *any substance* normally produced by the body and carried by the blood stream to distant parts which it affects for the good of the organism as a whole." He proceeds to give as examples of hormones, secretin, adrenalin, *and carbonic acid*.[2] I myself propose to use the word "hormone" in the wide sense employed by its inventor, although Dr. Blair Bell, following most authors, appears to wish to limit Professor Starling's definition to certain substances produced in definite organs.

As long ago as 1894 it was shown by the late Dr. George Oliver and myself that a specific organic substance is formed within the medulla of the suprarenal capsules which, when introduced into the blood, operates upon certain structures in the body in the same manner as drugs which are introduced from the outside; and, as a matter of fact, this very substance, which has been isolated, is now included in the Pharmacopœia amongst other drugs. Since that time several other specific organic substances of like nature have been discovered, although no other has as yet been chemically isolated. Seeking for a convenient term to express such specific organic substances, whatever their action might be, and realising my own classical shortcomings, I consulted with my friend and colleague, the late Professor W. R. Hardie, than whom, I suppose, our generation has seen no more accomplished classical scholar. It was he who suggested the term "autacoid" (not aut*o*coid, as Dr. Blair Bell is made to put it, owing, I trust, to a printer's error), derived from ἄκος, a remedy (whence also the term *panacea*, a universal remedy); and since this exactly expresses what is required—viz., a drug-like substance formed by the body itself—I adopted the term, defining an autacoid as a "specific organic substance formed by the cells of one organ and passed from them into the circulating fluid to produce effects upon other organs similar to those produced by drugs." But, like other drugs, autacoids either excite action or prevent action, and for clarity's sake it is not only convenient but necessary to have two words expressive of these opposite effects. To express excitation I adopted Professor Starling's term "hormone," which was already in general use; to express prevention the term "chalone," from χαλάω, to make slack. Thus the autacoids, as well as other drugs, could be classed either as *hormonic* or *chalonic* according as they excite activity or prevent it. To talk of provoking prevention, as Dr. Blair Bell proposes to do, is a contradiction in terms.

I may, I hope, be permitted to add without infringing the bounds set by modesty, that I have at least as good a right as Dr. Blair Bell to suggest an appropriate nomenclature for what is after all to some extent my own progeny.

I am, Sir, yours faithfully,

University of Edinburgh, Jan. 9th, 1917. E. A. SCHÄFER.

[1] Proc. Roy. Soc. Med., 1914.
[2] The italics are mine.

THE DIFFERENTIATION OF HEART MURMURS IN SOLDIERS.

To the Editor of THE LANCET.

SIR,—The remarks of Professor David Drummond in THE LANCET of Nov. 4th last regarding the influence of pressure upon the chest wall in altering the tone of cardiac murmurs suggest a comment upon the nature of such murmurs.

A systolic apical murmur in the days when I was a medical student was looked upon as an indication of grave cardiac trouble. We examined the heart carefully in cases of rheumatic fever, and the appearance of a murmur was virtually considered to justify condemnation of the patient, so far as health was concerned, for life. Yet the question arose how, if mitral regurgitation is occasioned by a deformity of the mitral valve which must take weeks or months to develop, can regurgitation be so quickly produced that a murmur may appear almost as soon as pain is complained of in the joints? Again, it was soon noticed that not only a mitral systolic murmur but also a pulmonary systolic murmur was often present. Then a paper by Dr. Arthur Foxwell appeared attributing a pulmonary systolic murmur to dilatation of the right side of the heart. Although Dr. Foxwell's explanation may not have been correct in every detail, it seemed to be reasonable, and probably his main contention true—namely, that the murmur is associated with dilatation of the right ventricle, chiefly in the neighbourhood of the conus arteriosus. Accepting Dr. Foxwell's explanation to be true, it was natural to conclude that if the pulmonary systolic murmur be due to dilatation of the right side of the heart, a mitral systolic murmur may also be due to dilatation of the left side of the heart. This view was strengthened by noticing how frequently a systolic apical murmur arising during rheumatism may disappear, and I wrote a short article in THE LANCET[1] which called forth a letter from Dr. D. B. Lees, saying that he was intending to publish observations which supported the view of dilatation of the heart occurring in acute rheumatism.

At that time it seemed reasonable to suppose—especially after meeting with definite cases of disease in the cardiac muscle in the post-mortem room, both in rheumatism and chorea—that the mitral systolic murmur was often due to dilatation of the heart allowing of mitral regurgitation. Yet it became evident, when looking up cases two to three years after a murmur had first been noted, that a mitral systolic murmur which had developed a harsh character before the patient first passed from under observation generally persisted, whereas a murmur described as lower-pitched more often than not disappeared. This gives rise to the question, What is the difference in causation of a low-pitched and of a high-pitched murmur? Can a systolic apical murmur be produced without the presence of regurgitation through the mitral orifice? Is it possible that the murmur may arise in the cardiac wall?

Professor David Drummond has recently commented upon the effect of pressure on the chest-wall upon cardiac murmurs, laying stress on the fact that many murmurs can be abolished by pressure. In my experience it is the low-pitched murmurs which are very materially affected, but I do not think are often completely abolished, by pressure. The lower tones disappear, but a residuum of higher tones of more blowing character may remain. We may assume that the higher-pitched tones possibly indicate some temporary leakage through the mitral valve. But how are the lower

[1] THE LANCET, 1896, ii, 170.

tones which disappear produced? In one detail I misread the letter of Professor Drummond when I recently ventured to add a note on my experience regarding the effect of pressure upon the chest-wall on murmurs. Professor Drummond appears to consider that the murmurs which disappear are due to vibrations of the chest-wall. It is difficult quite to gather his meaning. The chest-wall being the medium which, through the stethoscope, conveys murmurs to our ears must vibrate in all cases, but neither with functional nor organic disease can murmurs, it seems to me, originate in the chest-wall. If we abolish a murmur by pressure upon the chest-wall we presumably arrest the onward progress of those vibrations which compose the murmur. In those murmurs which we do not abolish the vibrations are of a different nature, probably smaller and more rapid, and pressure fails materially to influence them. Earlier I have suggested whether it may be possible that a systolic murmur may arise in movements of the heart-wall. In this connexion it may be interesting to remark that so frequently are slight functional murmurs audible both over the pulmonary and mitral areas in very young children that it seems to me they may be regarded as physiological. In other words, cardiac action alters to some extent as age advances and some time may elapse before the cardiac sounds we are familiar with in adults become the fixed sounds of the heart. If we allow the view that some low-toned functional murmurs are produced by vibrations arising in unusual behaviour of the cardiac systole then perhaps we may consider some cases in which functional murmurs are heard to be a return to the comparatively unstable condition of early childhood.

Whatever view may be held with regard to the possibility of functional apical systolic murmurs arising in the wall of the heart, in cases where a diastolic sound is audible between the first and second sound we have definite evidence of some abnormal cardiac action. An additional shock to that of the impulse can often be felt by the hand, and when the heart is diseased and much hypertrophied the abnormal impulse may, in rare instances, give a tracing in which the wave it indicates, though more transitory, may equal the wave of the systole in height. We are, however, speaking more particularly of hearts in which there is no disease. In them, although it is not so easy to obtain a graphic record of abnormal cardiac action, the same action is very commonly present. It may persist for days or weeks or be present at one moment and absent at another. The point, however, on which I wish to lay stress is that a diastolic sound occurring between the first and second sounds is associated with some abnormal cardiac action. This action may be an exaggeration of a physiological action. The frequency of its presence in children supports such a view. But the action, when present in a marked degree, is abnormal as far as the adult is concerned. The sound which appears in association with the abnormal action must also be regarded an abnormal, but as a rule is of no serious import. Yet I have known it frequently to be mistaken by well-qualified men for a presystolic murmur, and the subject of it to be diagnosed as a sufferer from mitral stenosis. The sound itself, however, need in no way be connected with valvular disease, and in most instances is merely an indication of some passing phase of cardiac action.

To sum up the foregoing remarks, it may be said that so-called functional murmurs are, as a rule, lower in tone than those having an organic origin. They are more materially affected by pressure. Although in the case of apical murmurs some temporary leakage of the mitral valve may be present, the question arises whether that portion of the murmur which can be readily abolished by pressure may not be due to vibrations associated with an abnormal cardiac systole. In favour of this view is the fact that in association with a diastolic sound, occurring between the first and second sounds, there is obviously an unusual action of the heart, which in most instances, being transitory, must be described as functional.

Since writing the above an observation, I believe of Sir Wm. Broadbent, has occurred to me, which may be worthy of note at the present time when so many soldiers who have undergone severe physical exertion are under medical supervision. Sir Wm. Broadbent, so far as I remember (I quote from memory), without referring to the theory of Dr. Foxwell concerning the method of production of the pulmonary systolic murmur, stated that he had met with cases in which healthy young men manifested pulmonary systolic murmur after prolonged physical exertion, such as mountain climbing. It would be interesting if this observation should be confirmed. It may be added also in connexion with the effect of pressure upon cardiac murmurs that I believe my attention was first drawn to the fact by a paper published by Dr. Sydney Ringer and Dr. A. G. Phear many years ago. Dr. Moxon once said that the "art of originality is the art of forgetting." There may occasionally be experiences with which one becomes so familiar that one forgets whether they first impressed themselves upon one's mind in virtue of their own force or whether some other observer has drawn one's attention to them.

I am, Sir, yours faithfully,

Jan. 8th, 1917. THEODORE FISHER, M.D. Lond.

STAPHYLOCOCCUS MENINGITIS.

To the Editor of THE LANCET.

SIR,—The diagnosis of the case described as staphylococcus meningitis by Dr. H. Bourges in your issue of Jan. 6th (p. 26) would appear likely to be at least doubtful. Contamination by *Staphylococcus albus* in my experience in lumbar puncture, however carefully the skin is prepared is fairly frequent, both in cases where the meningococcus is found and where it is not found. Gram-positive cocci in any turpentine abscess of some duration would not be uncommon. Authorities agree that many cases of cerebro-spinal fever occur where the causative organism which is very elusive is not found. The description of the case and the fact that the patient recovered makes it likely to be one of cerebro-spinal fever rather than one of staphylococcus meningitis.

In reference to this contamination you published a few issues back the description of a puncture needle specially designed to obviate its contamination by the operator's fingers. I find a simpler method is to flame the head of the needle after puncture and before withdrawing the stilette to collect the fluid.—I am, Sir, yours faithfully,

SHEFFIELD NEAVE,
Temporary Captain, R.A.M.C.
Military Laboratory for Cerebro-spinal Fever, Ipswich,
Jan. 7th, 1917.

A NEW CULTURE MEDIUM FOR THE MENINGOCOCCUS.

To the Editor of THE LANCET.

SIR,—In a recent investigation into the anti-coagulating action of acid aniline dyes on proteins, Holland[1] found that blood serum could be heated to high temperatures with these dyes without undergoing coagulation. He stated that blood serum, to which was added half its volume of a 2 per cent. solution of Congo red, set to a clear jelly after sterilisation at 120° C., and could be used as a culture medium for bacteria. This fact appeared to the writer, who had been doing much culture work with the meningococcus, to offer an easily prepared medium upon which that organism could be grown readily, and which could be used for plate cultures. Accordingly, sloped tubes of the Congo red serum were prepared in the inspissator, and it was found that the medium was transparent, at any rate, in the upper portion of the slope, although in the lower portion the colour was somewhat too dense to be accurately described as absolutely transparent. The top thin part of the slope was inclined to become hard. Stroke cultures of meningococcus on the new medium grew well, and discrete red colonies were plainly visible in the upper part of the stroke when examined with a lens through the medium. The viability of the organism in these cultures was quite good, subcultures being obtained after two to three weeks. The cultures also yielded the characteristic sugar reactions of the organism.

Plates of the new medium were prepared by pouring the liquid mixture into the plate and sterilising at 120° C. for 20 minutes. There being a considerable amount of expressed water, it was found inadvisable to use the inverted position for drying off the plates. The surface of the medium was somewhat soft, but it was quite transparent, and colonies could readily be examined under the microscope. An opportunity has not yet arisen for using these plates for obtaining

[1] Comptes Rendus, vol. clxii., p. 959.

cultures from throat swabs, but it is possible that plates of this medium might form a useful separation method for direct cultures from the throats of meningococcal contacts. In passing, it may be mentioned that the *B. diphtheriæ* grows well on the new medium.

In connexion with the keeping of laboratory cultures of the meningococcus on serum-agar and ascitic fluid media, the necessity for frequent subcultivation is well known. The claims of ordinary blood serum for this purpose would appear to have been somewhat overlooked. It has been found that Loeffler's serum forms a medium on which the meningococcus is long-lived. On more than one occasion the coccus has been found to be alive in cultures one month old. Either the new Congo red serum or Loeffler's serum is recommended for laboratory cultures of meningococcus, the tubes being kept in the incubator and subcultures made every fortnight.—I am, Sir, yours faithfully,

J. H. JOHNSTON, M.Sc.

Arundel-street, Strand, W.C., Jan. 6th, 1917.

THE HOT-AIR OVEN AS AN INSPISSATOR.

To the Editor of THE LANCET.

SIR,—In the absence of an inspissator in the bacteriological laboratory I have found that the hot-air oven can be utilised as such to far greater advantage than with the water-bath, the inspissator's usual substitute. Two pieces of glass rod calculated to give the required slope to the serum in the test-tubes are fixed by means of plasticine to a sheet of asbestos, the tubes of serum laid across each rod, and the whole placed in the oven. The purpose of the asbestos is to prevent any charring which might occur if the tubes were placed on the floor of the oven without any protection owing to the proximity of the Bunsen heater. I have found inspissation for 30 minutes at 80° C. ample in the majority of cases by the above method.

The great advantages of this technique are that it is a great deal quicker than with the water-bath, and the dimensions of the hot-air oven being generally in excess of those of the former a greater number of tubes can be inspissated at one time.

I am, Sir, yours faithfully,

E. L. COOPER,

Jan. 1st, 1917. Bacteriologist, No. 14 Mobile Field Laboratory.

UNIVERSITY OF EDINBURGH.—We have received from the secretary of the Senatus the annual report for 1916, containing the following items of medical interest. The total number of matriculated students during the year was 1741, of whom 1060 were men and 681 were women. Of these, 941 (including 238 women) were enrolled in the Faculty of Medicine. Of the students of medicine, 446 belonged to Scotland, 143 were from England and Wales, 34 from Ireland, 79 from India, 216 from British colonies and dependencies, and 23 from foreign countries. The number of medical students from the colonies and dependencies was 23 in excess of the number for 1915, South Africa accounting fully for the increase. The following medical degrees were conferred during 1916: Bachelor of Medicine and Master in Surgery (M.B., C.M.), 1; Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), 128; Doctor of Medicine (M.D.), 18. The total annual value of the University fellowships, scholarships, bursaries, and prizes in the Faculty of Medicine now amounts to £5565. Women students of medicine, who formerly received their education in extra-mural classes, have been admitted to University courses in all the subjects of the medical curriculum. An Ordinance is being promoted for the foundation of a chair in tuberculosis, funds amounting to £18,000 having been transferred for this purpose to the University Court by the Royal Victoria Hospital Tuberculosis Trust. Additional lecturers have been appointed in the Faculty of Medicine as follows: in pathology, Dr. James Miller; in materia medica, Dr. John Orr; in midwifery, Dr. J. W. Ballantyne. Mr. J. W. Dowden has succeeded Mr. C. W. Cathcart as one of the senior lecturers in clinical surgery. On Feb. 15th the death occurred of the venerable Principal, Sir William Turner, at the age of 84. His active association with the University—as demonstrator in anatomy, as professor of anatomy, and as Principal—extended over 62 years. The vacancy in the Principalship was filled up by the appointment, in May, of Sir J. Alfred Ewing, Director of Naval Education at the Admiralty.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Died.

Lieut.-Col. R. C. McLeod, Canadian Army Medical Corps, was a student at New York University Medical College, and was licensed in 1891. Before joining the Canadian Contingent he was in practice at North Sydney, Nova Scotia.

Wounded.

Capt. C. E. Whitehead, R.A.M.C.
Capt. J. H. Askins, R.A.M.C.
Capt. T. P. Cole, R.A.M.C., attached Royal Field Artillery.
Lieut. D. Campbell, R.A.M.C.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Capt. and Flight-Commander J. W. W. Nason, Royal Sussex Regiment, and Royal Flying Corps, younger son of the late Dr. C. St. S. R. Nason, of Corse Grange, Gloucester.

Second Lieut. R. N. Heathcote, East Yorkshire Regiment, only surviving son of Dr. R. Heathcote, West Didsbury, Manchester.

Second Lieut. W. D. Semple, King's Royal Rifle Corps, eldest son of Col. Sir D. Semple, Director-General, Public Health Department, Egypt.

MENTIONED IN DESPATCHES.

The names of the following officers of the medical services, whose "distinguished and gallant services and devotion to duty" he considers are deserving of special mention, are included in the recent despatch from Field Marshal Sir Douglas Haig, G.C.B., Commander-in-Chief of the British Armies in France:—

STAFF.

Black, Maj. R. B., R.A.M.C., Res. of Off.
Burtchaell, Col. C. H., C.M.G.
Macpherson, Surg.-Gen. W. G., C.B., C.M.G., Hon. Phys. to the King.
Sloggett, Lt.-Gen. Sir A. T., K.C.B., C.M.G., Hon. Surg. to the King.

ROYAL FIELD ARTILLERY.

Bailey, Surg.-Maj. F. W., D.S.O.
Peck, Surg.-Maj. E. G.

ARMY MEDICAL SERVICE.

Alexander, Lt.-Col. (temp. Col.) J.D., R.A.M.C.
Barefoot, Col. G. H., C.M.G.; Bewley, Col. A. W.; Blackham, Lt.-Col. (temp. Col.) R. J., C.I.E., R.A.M.C.; Bliss, Lt.-Col. (temp. Col.) S. W., R.A.M.C.; Bowen, Lt.-Col. (temp. Col.) A. W. N., R.A.M.C.; Brazier-Creagh, Lt.-Col. (temp. Col.) G. W., C.M.G., ret. pay; Browne, Col. E. G., C.B.; Browne, Maj. C. G., D.S.O., R.A.M.C.; Buswell, Lt.-Col. (temp. Col.) F. R., R.A.M.C.
Chopping, Lt.-Col. A., C.M.G., R.A.M.C.; Conway, Maj. J. M. H., R.A.M.C.; Cree, Col. G., C.M.G.
De Wesselow, Temp. Capt. O. L. V.; Daly, Col. T.; Dowsett, Lt.-Col. (temp. Col.) E.B., R.A.M.C.
Emerson, Maj. H. H. A., R.A.M.C.; Ensor, Bt. Col. and Lt.-Col. (temp. Col.) H., D.S.O., R.A.M.C.; Evans, Lt.-Col. (temp. Col.) P., C.M.G., R.A.M.C.
Fawcus, Lt.-Col. H. B., C.M.G., R.A.M.C.; Ferguson, Lt.-Col. (temp. Col.), J. D., D.S.O.; Furnivall, Maj. C. H., R.A.M.C.
Garrard, Col. J. J.; Gray, Col. W. L.; Greig, Lt.-Col. (temp. Col.) F. J., Res. of Off.
Harty, Maj. (temp. Lt.-Col.) T. E., R.A.M.C.; Hime, Lt.-Col. H. C. R., R.A.M.C.; Hinge, Lt.-Col. (temp. Col.) H. A., C.M.G., R.A.M.C.; Hooper, Lt.-Col. (temp. Col.) A. W., C.M.G., D.S.O.
Ievers, Maj. O., R.A.M.C.; Irwin, Col. (temp. Surg.-Gen.), J.M.
Logan, Capt. D. D., R.A.M.C.; Luther, Col. A. J.
Macdonald, Col. S., C.M.G.; MacLeod, Col. R. L. R.; Martin, Maj. C. J., R.A.M.C.; Martin, Maj. J. F., C.M.G., R.A.M.C.; Maughan, Maj. J. St. A., R.A.M.C.; Millar, Maj. C. R., R.A.M.C.; Morgan, Col. F. J.
Newland, Col. F. R.
O'Keeffe, Surg.-Gen. M. W., C.B.
Pike, Col. (temp. Surg.-Gen.) W. W., C.M.G., D.S.O.; Pocock, Col. H. I.; Poe, Lt.-Col. (temp. Col.) J., D.S.O., R.A.M.C.; Pollock, Lt.-Col. (temp. Col.) C. E., R.A.M.C.; Profelt, Lt.-Col. (temp. Col.) C. W., R.A.M.C.; Prynne, Lt.-Col. (temp. Col.) H. V., R.A.M.C.; Purser, Maj. L. M.
Roch, Lt.-Col. H. S., R.A.M.C.; Ryan, Maj. (temp. Lt.-Col.) R., D.S.O.
Scott, Col. B. H.; Scott, Temp. Capt. E., R.A.M.C.; Scott, Capt. T. H., M.C., R.A.M.C.; Shanahan, Lt.-Col. (temp. Col.) D. D., R.A.M.C.; Sheehan, Maj. G. F., R.A.M.C.; Sharren, Maj. H. G., R.A.M.C.; Silver, Lt.-Col. (temp. Col.) J. P., R.A.M.C.; Skinner, Col. B. M., C.M.G., M.V.O.; Slayter, Lt.-Col. (temp. Col.) E. W., C.M.G., R.A.M.C.; Symons, Lt.-Col. (temp. Col.) F. A., D.S.O., R.A.M.C.

Thomson, Maj. C. G.; Thomson, Col. J.; Thurston, Col. H. S., C.M.G., R.A.M.C.; Thurston, Maj. L. V., R.A.M.C.
Whaite, Col. T. du B.; Woodley, Maj. R. N., R.A.M.C.; Wright, Col. R. W.

CONSULTANTS.

Bowlby, Lt.-Col. (temp. Surg.-Gen.) Sir A. A., Knt., K.C.M.G., K.C.V.O., 1st Lond. Gen. Hosp., R.A.M.C.
Fowler, Lt.-Col. (temp. Col.) Sir J. K., K.C.V.O., 3rd Lond. Gen. Hosp., R.A.M.C.
Galloway, Maj. (temp. Col.) J., 4th Lond. Gen. Hosp., R.A.M.C.
Gray, Maj. (temp. Col.) H. McI. W., C.B., 1st Scottish Gen. Hosp., R.A.M.C.
Herringham, Lt.-Col. (temp. Col.) Sir W. P., Knt., C.B., 1st Lond. Gen. Hosp., R.A.M.C.
Holmes, Temp. Lt.-Col. G. M.
Rigby, Capt. (temp. Col.) H. M., 2nd Lond. Gen. Hosp., R.A.M.C.
Sargent, Temp. Col. P. W. G., R.A.M.C.
Sinclair, Temp. Col. T.
Smith, Capt. (temp. Col.) S. M., 3rd Lond. Gen. Hosp., R.A.M.C.

ROYAL ARMY MEDICAL CORPS.

Abraham, Temp. Capt. E. C.; Aldis, Temp. Capt. C.; Alexander, Capt. H. S. A., Spec. Res.; Anderson, Temp. Capt. J.; Armitage, Capt. F. R.; Armstrong, Maj. W. B.
Babington, Lt.-Col. M. H.; Barron, Capt. D. C. (temp. Maj., comdg. Fd. Amb.); Barse, Temp. Capt. G. A.; Bayley, Capt. J. H., Spec. Res.; Beaman, Capt. (temp. Maj.) W. K.; Beavn, Capt. F. A., M.C., Spec. Res.; Bennett, Maj. (temp. Lt.-Col.) W.; Benson, Temp. Lt.-Col. W. A.; Biggs, Capt. K., Spec. Res.; Bird, Maj. (temp. Lt. Col.) E. B.; Burdillon, Temp. Capt. L. G., D.S.O., M.C.; Boyce, Capt. W. W.; Bradish, Capt. (temp. Maj.), F. L.; Brebner, Capt. (temp. Maj.) C. S.; Broughton, Temp. Capt. N. W., D.S.O. (killed); Brunskill, Maj. (temp. Lt.-Col.) J. H.; Bryden, Maj. (temp. Lt.-Col.) R. A.; Buckley, Capt. C. D. M., Spec. Res.
Calver, Capt. H. M.; Campbell, Capt. W. K., D.S.O., Spec. Res.; Carruthers, Capt. W. D.; Carson, Temp. Capt. F.; Chambers, Temp. Capt. W. D.; Charles, Temp. Capt. R.; Clarke, Capt. H. M.; Clayton, Capt. J.; Clayton, Lt.-Col. W. K.; Clements, Lt.-Col. R. W.; Cockill, Lt.-Col. W. B.; Collinson, Lt.-Col. H.; Conway, Temp. Capt. J. A.; Coplans, Temp. Capt. M.; Cordner, Maj. (temp. Lt. Col.) R. H. L.; Craig, Temp. Capt. J.; Cunnington, Temp. Capt. E. C.
Davidson, Maj. (temp. Lt.-Col.) H. A.; Davison, Capt. W. H.; Day, Temp. Capt. H. B.; Demetriadi, Maj. (temp. Lt.-Col.) L. P.; Dennis, Capt. A. W.; Dennis, Maj. B. R.; Dive, Capt. (temp. Maj.) G. H.; Dixon, Capt. M.; Donovan, Capt. C. O.; Dunbar, Lt.-Col. B. H. V.; Dunkerton, Maj. (temp. Lt.-Col.) N. E.; Dunn, Lt.-Col. (temp. Col.) H. N.
Edwards, Capt. (temp. Maj.) G. B.; Elsner, Lt.-Col. O. W. A.; Ellis, Capt. F.; Emerson, Temp. Capt. H.
Fawcett, Maj. (temp. Lt.-Col.) H. H. J.; Ferguson, Capt. G. D.; Ferguson, Capt. N. M.; Fitzgerald, Bt., Lt.-Col. F. G.; FitzMaurice-Kelly, Temp. Capt. M.; Foster, Capt. F. G., Spec. Res.; Fotheringham, Capt. W., Spec. Res.; Fuhr, Lt.-Col. R. S. H., D.S.O.
Galpin, Capt. P. A.; Gask, Maj. G. E.; Gill, Lt.-Col. J. G.; Gilmour, Lt. W. N.; Gimson, Capt. E. C., D.S.O.; Goddard, Lt.-Col. G. H.; Goodwin, Lt.-Col. T. H. J. C., C.M.G., D.S.O.; Goodwin, Maj. (temp. Lt.-Col.) W. R. P.; Graham, Capt. N. F.; Grant, Temp. Capt. J. C. B.; Green, Capt. (temp. Maj.) T. A.; Griffiths, Temp. Capt. H. E.
Hacker, Capt. C. F., Spec. Res.; Haddon, Capt. D. A. R.; Haig, Maj. W.; Harding, Maj. (temp. Lt.-Col.) D. L., D.S.O.; Hardy, Temp. Capt. G. F.; Hart, Temp. Lt. A. P.; Harvey, Maj. (temp. Lt.-Col.) W. J. S.; Hawthorn, Lt.-Col. F.; Hewetson, Lt.-Col. H.; Hill, Temp. Capt. R. McC., D.S.O., Hodder, Maj. (temp. Lt.-Col.) A. E.; Howell, Capt. F. D. G., M.C.; Hudleston, Lt.-Col. W. E.; Hughes, Temp. Lt. H. L. G., D.S.O.; Hughes, Capt. L. E.; Hunt, Maj. (temp. Lt.-Col.) R. N.; Hunter, Temp. Capt. A.; Hunter, Temp. Capt. D. W., D.S.O.; Hurst, Temp. Capt. J. T.; Hyde, Maj. (temp. Lt.-Col.) D. O.
Ingram, Temp. Capt. T. L., D.S.O., M.C. (killed); Inkson, Lt. Col. E. T., V.C.; Irvine, Maj. (temp. Lt.-Col.) A. E. S., D.S.O.
Jacobs, Capt. C.; John, Capt. D. W., Spec. Res.; Johnston, Temp. Capt. J. G.; Jones, Temp. Lt. D. S.
Kavanagh, Capt. E. J., M.C.; Keay, Temp. Capt. A. C.; Kelly, Maj. (temp. Lt.-Col.) H. B.; Kendrew, Capt. A. J., M.C.; Knox, Maj. (temp. Lt.-Col.) E. B.
Lane, Capt. H. D.; Langstaff, Lt.-Col. J. W.; Lawson, Capt. J., Spec. Res.; Ligertwood, Temp. Maj. (temp. Lt.-Col.) C. E.; Lightstone, Capt. H.; Lilley, Capt. C. H.; Litchfield, Temp. Lt. E. M.; Lucas, Capt. H. A.
Macfadyen, Capt. D., Spec. Res.; Macfarlane, Temp. Lt. N. (since relinquished his commission); Macintyre, Temp. Capt. H. R.; Mackenzie, Capt. (temp. Maj.) D. F.; MacKenzie, Temp. Capt. J. T. (since relinquished his commission); Mackie, Capt. (temp. Maj.) G.; Mackinnon, Maj. (temp. Lt.-Col.) J.; Magill, Temp. Maj. R.; Mahoney, Maj. M. J., D.S.O., T.D.; Mainprise, Lt.-Col. C. W.; Maitland-Jones, Capt. A. G.; Manford, Capt. J. S.; Marshall, Capt. J. D.; Mavety, Temp. Capt. A. F.; Meadows, Maj. S. M. W.; Michell, Temp. Capt. R. W.; Miller, Capt. R. M.; Miller, Capt. T. M., M.C., Spec. Res.; Miller, Capt. W. A., D.S.O., Spec. Res.; Milne, Capt. J. E., D.S.O.; Montgomery-Smith, Maj. (temp. Lt.-Col.) E. C.; Moore, Maj. (temp. Lt.-Col.) E. H. M.; Moore, Capt. H.; Moriarty, Maj. T. B.; Morphew, Lt.-Col. E. M.; Morris, Capt. C. R. M.; Mulholland, Capt. H. G.; Mumford, Temp. Capt. W. G.; Murchison, Capt. (temp. Maj.) K. D.
Noble, Capt. T. P.; Norman, Lt.-Col. H. H.
Osburn, Maj. (temp. Lt.-Col.) A. C., D.S.O.
Parker, Temp. Capt. W. N.; Parry, Temp. Capt. W. H.; Percival, Capt. E., D.S.O.; Picken, Capt. A.; Pierse, Temp. Lt. J. A.; Pike, Capt. E. B.; Potter, Temp. Lt. S.; Potter, Maj. T. J.; Purdon, Capt. (temp. Maj.) W. B., M.C.
Quinn, Capt. J. P., Spec. Res.
Rafter, Capt. J.; Ranson, Lt.-Col. W.; Ray, Maj. (temp. Lt.-Col.) M. B.; Raddle, Temp. Capt. A. F.; Riddel, Capt. D. O.; Ritchie, Maj. (temp. Lt.-Col.) T. F.; Robertson Temp. Capt. G. D.; Robertson, Capt. W. L.; Robinson, Temp. Capt. H. H., D.S.O.; Robinson, Capt. (temp. Maj.) T. T. H.; Rose, Maj. (temp. Lt.-Col.) A. M.; Rothwell, Temp. Capt. T. A.; Rowlette, Temp. Lt. L. M.; Rudkin, Temp. Capt. G. W. R.
Sayres, Maj. (temp. Lt.-Col.), A. W. F.; Scott, Capt. G.; Scott, Capt. R. L.; Scott, Capt. R. S.; Seelly, Temp. Capt. E. Selby, Capt. E. J.; Sharp, Lt.-Col. (temp. Col.) A. D., C.M.G.; Shea, Surg.-Maj. A. W.; Sheridan, Capt. B. C. O.; Simpson, Capt. G. C. E.; Smalley, Capt. A. A., Spec. Res.; Smeeth, Maj. (temp. Lt.-Col.) H. G.; Smith, Capt. C. N.; Smith, Capt. G. F. R.; Stephenson, Capt. J.; Stewart, Maj. (temp. Lt.-Col.) H., M.C.; Stockdale, Capt. G. V., Spec. Res.; Stuttaford, Temp. Lt. W. J. E.; Summerhayes, Maj. J. O.; Svenson, Lt. R.
Taylor, Capt. L. W. O., Spec. Res.; Teggart, Temp. Capt. J. C. T.; Terry, Temp. Capt. L. H.; Thompson, Lt. Col. A. G.; Thompson, Capt. J. E. G.; Thompson, Maj. (temp. Lt.-Col.) R. J. C., D.S.O.; Turner, Maj. (temp. Lt.-Col.) P.
Upcott, Temp. Capt. H.
Vey, Capt. D. C.
Walker, Temp. Maj. (temp. Lt.-Col.) A. N. (killed); Walker, Temp. Capt. H.; Wallis, Lt. M. J. T.; Warburton, Capt. J. R. N., Spec. Res.; Watkins-Williams, Temp. Capt. P. L., D.S.O.; Watson, Lt.-Col. A. A., Spec. Res.; Watts, Lt.-Col. (temp. Col.) B.; Wigmore, Capt. J. B. A.; Wiley, Maj. W.; Wilmot, Maj. R. C.; Wilson, Capt. A.; Wilson, Capt. G. E. C.; Wilson, Temp. Capt. H. B.; Winter, Maj. (temp. Lt.-Col.) M. G.; Wingate, Maj. (temp. Lt. Col.) B. F.; Wood, Maj. (temp. Lt.-Col.) J.; Wright, Capt. (temp. Maj.) W. G.
Yates, Temp. Capt. G. D.; Young, Capt. W. H.

ROYAL NAVAL DIVISION MEDICAL UNIT.

Stanford, Staff-Surg. C. E. C.

ARMY VETERINARY CORPS.

Anderson, Temp. Capt. W.

AUSTRALIAN ARMY MEDICAL CORPS.

Anderson, Maj. J. H.; Bailey, Capt. G. B.; Barber, Col. G. W.; Butler, Maj. A. G., D.S.O.; Butler, Lt.-Col. H. N.; Byrne, Maj. G. C.; Catford, Capt. H. R.; Dods, Maj. J. E., M.C.; Embleton, Capt. D.; Fry, Maj. H. K.; Hardy, Lt.-Col. (temp. Col.) C. H. W., V.D.; Hearne, Lt.-Col. W. W.; Henderson, Capt. R. L.; Horn, Lt.-Col. A.; Huxtable, Lt.-Col. R. B.; Jeffries, Maj. L. W.; Lewers, Maj. H. B.; Marks, Maj. A. H.; McGregor, Maj. R. S.; McLennan, Capt. S.; Mattel, Maj. C.; Meikle, Lt.-Col. A. J.; Phipps, Lt. Col. J. H.; Plant, Capt. H. F. H.; Powell, Capt. A. H.; Ross, Lt.-Col. T. G.; Savage, Capt. V. W.; Shaw, Lt.-Col. C. G.; Smith, Capt. A. C.; Sturdee, Lt.-Col. (temp. Col.) A. H., C.M.G., V.D.; Sutton, Col. A.; Wall, Capt. F. L.; Welch, Maj. J. B. St. V.; Winn, Capt. R. C.; Woollard, Capt. (temp. Maj.) H. H.

CANADIAN ARMY MEDICAL CORPS.

Barton, Capt. N. J.; Birkett, Col. H. S.; Blanchard, Lt.-Col. R. J.; Blaylock, Maj. E. H.; Burnett, Maj. P.; Foster, Col. G. LaF., C.B.; Hardisty, Capt. R. H. M.; Hardy, Lt.-Col. E. B.; Harris, Maj. L. C.; Hart, Capt. H.; Jacques, Lt.-Col. H. M.; Macdonald, Capt. R. St. J.; Peters, Lt.-Col. C. A.; Robertson, Capt. D. E.; Ross, Col. A. E., C.M.G.; Ross, Capt. S. G.; Scott, Capt. W. H.; Snell, Maj. (temp. Col.) A. E.; Walsh, Capt. J. P.; Webster, Lt.-Col. W.; Wright, Lt.-Col. R. P.; Young, Lt.-Col. T. W. H.

NEW ZEALAND MEDICAL CORPS.

Begg, Col. C. M., C.M.G.; Bogle, Capt. G. V. (killed); Carbery, Maj. A. R. D.; Murray, Lt.-Col. D. N. W.

SOUTH AFRICAN CONTINGENT.

Lawrie, Temp. Capt. M. B.; Pringle, Temp. Maj. R. N.; Welsh, Temp. Capt. T.

INDIAN MEDICAL SERVICE.

Manifold, Col. C. C., C.B.

THE EMPLOYMENT OF AMERICAN DOCTORS.

Publicity has recently been given in the daily press to the statement that young American doctors have volunteered their services and will be freely substituted for British doctors in the hospitals of this country in order to set free the present medical officers of military age for active service abroad. A recent statement in an American journal that the Director-General of our Army Medical Service had asked for the supply of a hundred or more young American doctors has, we believe, not been contradicted, and may therefore be taken as the policy of the Army Medical Department. To them will be allotted posts in military hospitals in this country which they can fill without possessing either a commission or a qualification registrable here. A corresponding number of British doctors of military age holding commissions will thus be set free. So far, then, as military occupation goes, the accounts in the daily press have been based upon fact, if misleading in detail. As regards civilian practice, as far as we know, the question of the employment of American doctors has not arisen in any practical form. The legal obligations of the civilian practitioner, both in hospital and private practice, prevent the employment here of those whose names do not appear on the British Medical Register. So long as the present absence of reciprocity between the United States and this country in medical matters remains unrectified, registration implies the obtaining in this country of a medical diploma recognised by the General Medical Council.

NEW RED CROSS HOSPITAL FOR GLOUCESTER.—The Bishop of Gloucester's Palace at Gloucester has been fitted up as a Red Cross hospital. It will accommodate 100 patients, contains an X ray apparatus, and a complete electrical massage installation.

OBITUARY OF THE WAR.

NORMAN ERNEST JASPER HARDING, M.B., CH.B. EDIN.,

MAJOR, ROYAL ARMY MEDICAL CORPS.

Major N. E. J. Harding, who died of cholera at Colaba Military Hospital on August 10th last while in command of a stationary hospital at Bombay, was 41 years of age. He studied at Edinburgh and at University College, Liverpool, graduating in medicine at Edinburgh University in 1900, and entering the Royal Army Medical Corps a year later, after taking a diploma in Public Health. He obtained his captaincy in 1906, and his majority in 1914. He was seriously wounded in the Boer War, and for his services at that time was decorated with the Queen's medal with two clasps and the King's medal. He went to France with No. 12 General Hospital on the outbreak of war, and served there for 15 months, before taking to India the unit which he was commanding at the time of his death. Previously to the outbreak of war he had served in Burma and on the West Coast of Africa. He contributed an article on the Value of Koch's Treatment of Malaria, to the *Journal of the Royal Army Medical Corps*, and other articles of a historical and professional character.

In 1908 Major Harding married Dorothy, oldest daughter of the late Ernest Wetton, of Maidstone, and of Kobe, Japan.

ROGER FORREST HUGHES, B.A., M.B., CH.M. SYDNEY,

CAPTAIN, AUSTRALIAN ARMY MEDICAL CORPS.

Captain R. F. Hughes, who was killed on active service on Dec. 11th last, was 26 years of age and the elder son of Sir Thomas Hughes, who was for many years Lord Mayor of Sydney. He was educated at St. Ignatius College, Sydney, entering the Sydney University, where he first graduated in arts, and obtained his medical qualifications at the end of 1915. He then filled the position of resident medical officer at St. Vincent's Hospital until March, 1916, when he enlisted in the Australian Army Medical Corps. After serving for six months at a base military hospital in Sydney he was detailed for service as regimental medical officer to an Australian battalion in France, arriving there early in December. Ten days later while dressing a wounded man in his advanced station he was severely wounded and died the same day. Captain Hughes was well known in athletic circles in Sydney. He represented his school at cricket and football and his university at hockey. Just prior to leaving Australia he married Eileen, youngest daughter of M. E. Maher, of Collaroy Station, Merriwa, N.S.W., with whom and his parents much sympathy will be felt for his untimely death at the outset of a promising career.

CHARLES KENNETH McKERROW, M.A., M.B., B.C. CAMB.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain C. K. McKerrow, who died of wounds received the same day, on Dec. 20th last, at the age of 33, was elder son of the late Dr. George McKerrow, of Ayr. He was educated at Cargilfield and Charterhouse Schools, gaining from the latter the Science Scholarship of his year for Cambridge, and later an open scholarship at Clare College. He took a first class in science, graduated M.B. and B.C. in 1908, obtaining in the same year the diploma of the Conjoint Board. After holding resident posts at St. George's Hospital and being extern to the 1st Frauenklinik in Vienna, he joined his father in practice in Ayr for some years. On obtaining a commission in the R.A.M.C. in June, 1915, he was appointed regimental medical officer to a battalion of Northumberland Fusiliers, going with them to France, where he remained until his death.

Captain McKerrow was not one-sided in his development. At school and later he had some reputation as a middle-weight boxer, and he also played Association football for his college. His superior officer writes of him: "A few days before his death Captain McKerrow read an excellent paper on Trench Fever before our Divisional Medical Society, giving proof of his careful clinical work even in the trenches. I formed a very high opinion of him both as a gallant soldier and a skilful surgeon. He was absolutely fearless in the performance of his duty."

In January, 1915, Captain McKerrow married Jean, only daughter of the late James Craik, and leaves a widow and one son.

CLIFFORD CRAWSHAW PICKLES, M.R.C.S. ENG., D.P.H. LEEDS,

LATE CAPTAIN, ROYAL ARMY MEDICAL CORPS (T.F.).

Mr. C. C. Pickles, who died on Dec. 22nd last, after being invalided out of the Royal Army Medical Corps, was 30 years of age, and the third son of Dr. J. J. Pickles, of Camp-road, Leeds, of whose six sons five were members of the medical profession and one a student before the war. Educated at the Leeds Grammar School, Clifford Pickles entered the School of Medicine at the University of Leeds, obtaining in 1909 the Conjoint Board qualification, and two years later the Public Health diploma of his University. After holding resident appointments at Leeds and acting as assistant in general practice at Harrogate and Ossett he was appointed medical inspector of school children under the North Riding Education Committee and was stationed at Malton, where he was also in charge of the local company of the 5th Yorkshire Territorials. At the outbreak of hostilities he was medical officer at Gateforth Sanatorium, near Selby, and on mobilisation served with the 5th Yorkshire Regiment at home for some months, after which he was transferred to the medical service as a captain. He went out to France in

April, 1915, in charge of a clearing station, came home three months later with severe shell shock, and was invalided out of the service in October, 1915. In spite of his poor health he then took over the practice at Earby of his brother, the late Surgeon P. D. Pickles, who died of gas poisoning after going down with H.M.S. *Russell* in the Mediterranean last year. Unfortunately, his health did not improve, and an attack of broncho-pneumonia following influenza proved fatal.

Captain C. C. Pickles's service to his country was undertaken with no thought of himself. His transference from combatant to medical service was made at a time when doctors were urgently required for the Army, and the strain of his work contributed to the illness from which he never quite recovered. His record and that of his family are a notable achievement. Captain Pickles married in June of last year Dorothy B. E. Wilkinson, only daughter of Charles Wilkinson, of Boston Spa and Leeds.

THE FIRST BRITISH RED CROSS UNIT IN ITALY.

We have received from Dr. G. S. Brock, chief medical officer to the unit, a report of the first year's hospital work drawn up for the Joint War Committee, from which we take the following :—

Villa Trento, the headquarters of the ambulance unit, is on the high road beyond the bridge over the river Natisone at Manzanol, and within a dozen miles of the fighting on the Isonzo front, on Monte Sabotino, at Oslavia, and on Monte Podgora. The villa is a large building of seventeenth century design, belonging to the Conte di Trento, with a central portion of three storeys and wings of two storeys, flanked on either side by tall pine trees. Behind the latter, on one hand, is a line of offices occupied by a detachment of Carabinieri, while on the other is a long building of which the upper storey, ordinarily used as a granary, now forms an important part of the hospital. There is plenty of garden space where convalescents can take air and exercise enjoyably.

Dr. Brock tells us that at the time of the unit's arrival (Sept. 5th, 1915) the villa was occupied as an Italian hospital and the first ambulance work consisted in transporting some 50 patients to the neighbouring Abbazia Hospital. Much had then to be done both in improving the very bad sanitary conditions and in adapting the villa to its purpose. This work, performed almost entirely by members of the unit, was speedily carried out. On Sept. 12th was received the first batch of 8 patients, and by the end of the month the number accommodated was 55. After dealing with defective sanitation the unit turned its attention to getting a satisfactory water-supply. Water from a deep well was found by Captain Franchini, of the VI. Army Corps, to be quite free from pathogenic organisms. A second source from an open stream, in spite of filtering, was impure, but no doubt often found its way into the unit's food and drink. Fortunately another source became available from the Acquedotto Poiano by the kind help of Colonel Moreno, of the "Genio" of the Army Corps, to which the unit is attached. This water is of excellent quality and practically unvarying quantity, is moderately soft, and under high pressure. The effect of this new water-supply on the health of the unit was immediate, there being no longer cases of diarrhœa. The absence of heating arrangements did not lead to serious inconvenience during the summer, but on the approach of cold weather something had to be done. The Genio provided stoves for all the wards and also for some of the rooms. By means of these and a number of petroleum stoves the villa has been fairly well heated. The villa is lighted by its own electric installation of gas-engine accumulators. The laundry arrangements were totally inadequate. Application was made to General Cavicchia, of the Direzione di Sanità of the 2nd Army, laying before him a scheme for the erection of a disinfecting-room, washhouse, ironing-room, and drying room, which he very kindly had carried out by the Genio, and also provided a steam disinfector and a complete set of apparatus, consisting of two large galvanised-iron boilers, a soaking tank, and a rinsing machine. Regarding the disposal of refuse, all combustible materials are burnt by two incinerators—one of brick built by the unit, the other of iron supplied by the Direzione di Sanità. Non-combustible materials are buried in a neighbouring field.

The original idea in the minds of the organisers of the ambulance unit, Dr. Brock tells us, was to provide as an adjunct to it a small evacuation hospital of 25 beds with 25 stretchers for cases requiring to remain in the hospital for a few hours only. The accommodation, however, has been gradually so greatly extended that 97 patients can now be provided with beds, and there is room in an emergency for more. The unit's funds do not at present allow of filling more than about 65 of these, and this may be considered for the moment the normal number. The ground floor of the villa was appropriated, as far as possible, for hospital purposes. The outbreak of Asiatic cholera made it necessary to prepare an isolation ward. A part of the granary was partitioned off into two rooms, one for suspected cases and the other for cases such as typhus or cholera. After the great battle in the first week of November, 1915, a great rush of wounded came from the Gorizia section. All the beds (54) in the villa were quickly filled and the remainder of the patients were put on mattresses or on straw in the granary in four long lines. As many as 150 patients were at one time in the hospital. The remaining part of the granary has since been partitioned off and divided into two, so as to form two large wards.

An out-patient department has also become a necessity. Many soldiers sent from the front into reserve are encamped in this neighbourhood, often unaccompanied by a medical officer. In case of illness they usually come for advice to this hospital. The number of these soon necessitated an out-patient department. A waiting-room and consulting-room have been partitioned off in the granary, and this work is undertaken by an Italian colleague, Lieutenant De Lisi, who has been attached to the unit from the first and has rendered invaluable assistance.

The pharmacy of the hospital is under the care of Lieutenant Balotta, another Italian officer detailed by the Direzione di Sanità to assist the unit. A certain amount of the drugs used has come from England, but the greater part of the pharmacy supplies is obtained from the "Magazzino Avanzato" of Udine. These are used not only for the hospital, but also for the out-patients. A certain equipment (hospital supplies other than drugs) was brought out from England and more followed later by sea. But a great many things had to be obtained locally, as, for instance, the furniture of the operating-room. Fortunately a large number of bales containing such stores, collected by the Ladies' Committee in England and Scotland, were sent with members of the unit coming out in time for the great rush of wounded. Since then the hospital has received many generous contributions of money and supplies from friends in Britain and from British residents in Italy. Large consignments have been received from various war hospital supply depôts, including those of Kensington, Belgravia, Norwich, and Rome, and a very large one has now arrived from the Scottish Red Cross.

When the hospital was opened in September, 1915, the unit expected to act only as a clearing station. Later, according to instructions received from Colonel Moreno in regard to the stay of wounded in the hospital, the unit was to work only as a field hospital. It was soon realised, however, that when little fighting was in progress the work done might be that of a small base hospital, but when a rush of wounded is anticipated all the sick and wounded who can be safely transported are evacuated in order once more to take on the rôle of a field hospital.

The medical staff consists of the chief medical officer, who is also its "direttore," and two surgeons. The present chief medical officer has been with the unit since its work began. The two surgeons, Dr. W. E. Thompson, and Dr. W. A. Propert, joined later—in October, 1915—when Dr. W. R. Dakin and Professor Henry Tonks, F.R.C.S., the well-known artist, who had come out with the unit, were obliged to leave by other engagements. Mr. R. Creasy, of Windlesham, Surrey, took duty for a month at the beginning of 1916 in the absence of one of the surgeons. Dr. Propert rejoined some time ago. As to nursing, the unit at first went on as best it could with the help of men belonging to the unit and of some Italian soldier orderlies. Nineteen of the members, seven of them medical students, took duty as nurses and dressers. Eventually the authorities consented to female nurses being employed. The advent of female nurses made a vast difference for the better, many of them speaking Italian. Of our male nurses and dressers only five remain on the hospital side.

Up to the end of March, 1916, the numbers of patients treated were as follows :—

Consultations in out-patient department	1422
Total admitted to hospital up to March 31st	1022
,, discharged ,, ,, ,, ,, ...	967
In hospital on April 1st	55
Average number of days in hospital per patient ...	9·8
Total number of deaths	27
Deaths per cent. of patients admitted	2·6
,, ,, among sick only	0·1
,, ,, ,, wounded only	4·5

The death-rate was thus very low considering the many severe cases. The only death among medical cases was in a case of double pneumonia. The 398 sick discharged were nearly all cured or convalescent. Among the few exceptions were eight cases of cholera removed to cholera hospitals on diagnosis, four terminating fatally. Cases of frozen feet with the skin apparently uninjured have been counted as medical, but those with the skin blistered or broken as surgical. The nature of the medical cases chiefly met with will be seen from the following table, relating to 450 sick admitted up to the end of March, 1916.

Disease.	Percentage to total sick.	Months of prevalence.
Frozen feet	14·0	December, January, and February.
Gastro-enteritis (including gastritis and enteritis)	13·5	All months, but especially December and March.
Fevers of influenzal type, "trench fever"	12·0	December and March.
Rheumatism, chronic and muscular	9·0	All months.
Bronchitis	7·0	From November onwards.
Jaundice	6·0	January, February, and March.
Paratyphoid	3·8	From November onwards.
Pleurisy	2·9	From December onwards.
Otitis media	2·0	,, ,, ,,
Conjunctivitis	2·0	February and March.
Cholera	1·8	Nov. 9th to Dec. 7th.
Pneumonia	1·6	December, January, and February.

It is remarkable that no case of cholera occurred in members of the unit, many of whom were constantly coming in contact with cholera patients; this was no doubt the result of the precautions taken, including anti-cholera vaccinations of nearly all the members shortly after arrival with vaccine supplied by the Lister Institute of London. It is also striking to find true typhoid absent, as well as the comparatively large number (17) of paratyphoid cases. In the Italian Army antityphoid vaccination has been practised, but not antiparatyphoid vaccination. A combined vaccine is, however, now being largely used containing 800 million typhoid and 500 million paratyphoid B bacilli per cubic centimetre, in three doses at intervals of a week, the last two doses of 1 c.c. being double the first. The paratyphoid was on the whole of a benign type and unaccompanied by grave complications. A great difference of opinion prevails as to the causation of "piedi congelati" (frozen feet). Dr. Brock is convinced that the puttee is the chief offender.

There have been a great many visitors, both Italian and English. The King of Italy has paid three visits, at the last one decorating the commandant, Mr. G. M. Trevelyan, with the silver medal for valour. Another royal visitor on three occasions was the Duchess of Aosta.

A report follows on the surgical cases in the hospital by Mr. W. E. Thompson, M.B., Ch.B. Edin. The numbers of surgical cases, he tells us, greatly varied. At the commencement wards had been prepared and an operating theatre reconstructed. Instruments in large variety, tables and cupboards of good sterilisable material were procured and a good supply of dressings was put ready to hand. It was soon found that more apparatus was needed, especially a bacteriological laboratory and an X ray installation. Both of these have since been sent, the microscope the gift of Miss Gray, of Rome. The other gift, the X ray installation, is largely owing to the generosity of Dr. Barbour, of Edinburgh, and Mr. Saunders, of Croydon. A great variety of surgical cases has been dealt with from cuts and bruises to severe head, chest, and abdominal injuries. Up to March 31st, 1916, there were 84 operations, 34 of these being major. Taking into account the severity of so many cases where the only object attainable was relief of suffering, the death-rate of operation cases was just over 10 per cent. and the total mortality of all surgical cases about 1·5 per cent. There were 21 amputations of the leg and arm—12 being of the leg. Four cases of traumatic empyema were operated on, in one a piece of shrapnel being literally picked off the back of the heart. Practically every surgical case required drainage in some form, and some for a length of time. For gas gangrene nothing was found better than peroxide of hydrogen and eusol, followed by 5 per cent. saline. The best absorbent dressing for these cases was the sphagnum moss bags presented by Mr. C. W. Cathcart, of Edinburgh, and others. These were a great saving in dressings as well as an ideal dressing.

Two supplementary reports bring the figures up to the end of June and August respectively, and deal with the second year of work. During the three months April to June the total patients admitted increased from 1022 to 1492—792 sick, 700 wounded. Unfortunately on June 7th the unit lost Dr. Propert's services by his enforced return to England. For the month of August the admissions to hospital reached a high figure, especially in the early part during the great Italian offensive which resulted in the capture of Gorizia, when there was a daily average of 160 occupied beds. As may be easily imagined, the strain on organisation and personnel was very severe, since not only were the numbers sometimes double that for which the unit is normally equipped, but it had to play the rôle of a clearing hospital as well. Fortunately a great many wounds were light, many patients in a day or two being fit to return to their regiments. Great although the strain was, everything went on with wonderful smoothness and efficiency, calling forth praise both from the Italian military and sanitary authorities and from the Chief Commissioner of the British Red Cross for the Mediterranean, Sir Courtauld Thompson, who happened to be here during the most strenuous part of it.

THE PANEL COMMITTEE FOR THE COUNTY OF LONDON AND THE MOBILISATION OF THE MEDICAL PROFESSION.

The following resolutions were passed by the Panel Committee of the County of London at their meeting on Tuesday last, Jan. 9th :—

(*a*) That the Panel Committee are of opinion that, in respect to the proposal to mobilise the medical profession, it is essential, in order to secure the efficient working of any scheme adopted, that extended powers be conferred upon the Central Medical War Committee in connexion therewith, and that the personnel of the Committee be strengthened by the addition of at least six practitioners actively engaged in panel practice, one of whom should be a woman.

(*b*) That the Panel Committee are of opinion that, in so far as the recommendations of the Central Medical War Committee shall have reference to the services rendered by the medical profession to the civil population, if accepted, these should be carried into effect by a small executive committee appointed from the members of the Central Medical War Committee, with lay members appointed by the Director of National Service.

(*c*) That the Panel Committee are of opinion that the difficulties of these Committees in this connexion would be greatly lessened and a considerably increased number of medical men set free for active service abroad without serious interference with the medical needs of the civilian population if much greater use were in future made of the part-time services of civilian doctors for the treatment of sick and wounded soldiers whilst in hospitals and for other military duties in this country.

(*d*) That copies of the foregoing resolutions be forwarded to the Central Medical War Committee, the Director of National Service, and to the other Government Departments concerned.

We comment on these resolutions elsewhere.

CONVALESCENT HOME IN CALCUTTA.—An offer has been made and accepted from Calcutta to entertain 100 men and 10 or more officers invalided from Mesopotamia. Mr. Galstaun has given the use of his house in Circular-road, while Raja Kristo Das Law has lent No. 23 Theatre-road as a residential club for convalescent officers. The Calcutta nursing division of the St. John Ambulance Brigade are fitting out these two fine residences for the purposes they are to serve. The estimated cost of the furnishing and upkeep for five months has been put at 1½ lakhs of rupees, and this amount is likely to be forthcoming.

METROPOLITAN ASYLUMS BOARD: THREATENED SHORTAGE OF AMBULANCES.—The lack of motor and driver mechanics is reducing the ambulance service of the Asylums Board to a dangerous extent. The Ambulance Committee states that 37 per cent. of the ambulances are awaiting repair, and that probably within a few months the ambulance service will be unable to remove fever patients from their homes. The committee urges on the Board the necessity for the return of mechanics who have been taken for Army or munitions service.

Obituary.

THE SENATOR DE GIOVANNI.

OUR Rome correspondent writes:—After Grocco, Baccelli, and, after Baccelli, De Giovanni, the Tuscan, the Roman, and now the Venetian schools respectively have, in the year just closing, lost their most brilliant medical ornaments.

Born near Mantua on Sept. 27th, 1837, Achille De Giovanni began his medical studies in his native Lombardy, but, like so many of his compatriots, had to suspend them on the outbreak of the war against Austria. Serving under Garibaldi, whose commendation he earned in the fighting line, he re-entered the classes in 1860, the year of Lombardy's liberation, and threw himself into their work with an ardour which carried him with distinction through the curriculum till his graduation, with honours, in the final school. More than one University thereafter solicited and gained his services on its clinical staff, Pavia, Naples, and Padua especially, but in the last-named he found such acceptance that he never left it, and became from year to year the most popular and effective teacher on its medical professoriate. A consultant in much request throughout the kingdom, he was also a conspicuous figure at the medical congresses held annually in the leading cities, contributing to the transactions and debates papers on auscultation and percussion, on gout, on "dry arthritis," and on the pathology of the vena cava inferior, to enumerate some of his best known work. But in his later years State medicine became his absorbing interest, particularly in the field of tuberculosis, where he followed up a series of elaborate clinical investigations by others of a purely prophylactic tenor, till he was recognised as the inspiring spirit, and indeed as the initiator, of the "Lega Internazionale contro la Tuberculosi." His professional distinction and his public spirit won for him admission into the Senate of the kingdom, where he made his knowledge and his sagacity felt in many a debate on hygienic legislation. In private life he was austere even to stoicism, while essentially kind of heart and gracious in manner and address. His death, in its dramatic suddenness, was quite in keeping with the tenor of his life. He had opened the Medicus Annus of the Paduan school by a brilliant address on Monday, Dec. 4th, when, next day, he fell ill with cardiac symptoms supervening on the rheumatism to which he had long been a martyr, and in four days he succumbed. In both Houses of Parliament his death was put on record as a "national loss," while his *Alma Mater*, of which he had for four years been Rector Magnificus, suspended its functions, with the flag of Italy half-mast high.

Medical News.

UNIVERSITY OF LONDON.—At the First Examination for Medical Degrees, held recently, the following candidates were successful:—

Frances Dacre Alexander and Eleanor Mary Ashmall, London (Royal Free Hospital) School of Medicine for Women; **Frederick Bach**, London Hospital; **Ormonde Alan Baker**, University College; **Gladys Lieba Buckley**, Girton College; **Dora Mahalah Cadman**, London (Royal Free Hospital) School of Medicine for Women; **Antoine Yves Cantin**, London Hospital; **Linda Catmur**, **Dorothy Spencer Chamberlain**, **Ivy Collier**, and **Annie Evelina Connan**, London (Royal Free Hospital) School of Medicine for Women; **Marguerite Eilaline Cooke**, private study; **Rustam Nusserwanji Cooper**, University College; **John Alexander Currie**, Guy's Hospital (distinction in Physics); **Percy Tyson Davidson**, Middlesex Hospital; **Betty Dent**, London (Royal Free Hospital) School of Medicine for Women; **Conor John Donelan**, St. Paul's School and St. Bartholomew's Hospital; **Hilda Ray Dutton**, University College, Exeter; **Keridwen Valentine Edwards**, University College, Cardiff; **Lucy Margaret Elsom**, Victoria University of Manchester; **Rowland Henry Evans**, University College, Cardiff; **Geoffrey Edward Woolcombe Felce**, Guy's Hospital; **Bessie Dorothy Fenwick**, London (Royal Free Hospital) School of Medicine for Women; **Olive Gwendolin Fisk**, Girton College; **William John Gale**, B.Sc., Battersea Polytechnic S.-W. Polytechnic I., and private study; **Mark Garden**, London Hospital; **Lena Bella Gayer** and **Geraldine Norah Geary**, London (Royal Free Hospital) School of Medicine for Women; **Brian Wilson Barnett Gordon**, Epsom College and St. Mary's Hospital; **Barnett Gould**, B.A., London Hospital; **Marjorie Pearl Christine Greene**, Roedean School; **Stanley Allwright Guntar**, St. Bartholomew's Hospital; **Frederick James Simkin Hall**, University College, Reading; **Gertrude Eleanor Harre**, Girton College and London (Royal Free Hospital) School of Medicine for Women; **Elizabeth Merriman Heath**, **Marjorie Browning Hubert**, and **Irene Esther Kenworthy**, London (Royal Free Hospital) School of Medicine for Women; **Oscar Bevan Lean**, Bootham School; **Bessie Levin**, University College; **Denzil Haydn Lewis**, St. Mary's Hospital; **Ivor Lewis**, University College, Cardiff; **Muriel Jessie Lough**, B.Sc., Birkbeck College; **Mary Catherine Lynch**, London (Royal Free Hospital) School of Medicine for Women; **Ivan Bailey McCann**, Guy's Hospital; **Dorothy McNair**, London (Royal Free Hospital) School of Medicine for Women; **Edward Francis Malins**, King Edward's High School, Birmingham; **Harold Jordan Malkin**, University College; **Amin Mikhail**, King's College; **Emily Marjorie Milnes**, London (Royal Free Hospital) School of Medicine for Women; **Sybil Grace Mocatta**, King's College and London (Royal Free Hospital) School of Medicine for Women (distinction in Inorganic Chemistry and in Physics); **Leslie Stuart Morgan**, St. Bartholomew's Hospital; **Doris Maude Odlum**, B.A., London (Royal Free Hospital) School of Medicine for Women; **Winifred Catherine Piggott**, Bootham School, Bedford College, and London (Royal Free Hospital) School of Medicine for Women; **Mary Winifred Pitt Lewis**, **Beatrice Myrtilla Powell**, and **Gwendolen Mary Pratt**, London (Royal Free Hospital) School of Medicine for Women; **Margaret Annette Quine**, Victoria University of Manchester; **John Grosvenor Reed**, Epsom College and St. Thomas's Hospital; **James Stuart Ricketts**, King's College; **Edith Margaret Ross-Johnson**, Newnham College; **Effie Frederike Amelia Samter**, Victoria University of Manchester; **E. Virginia Saunders-Jacobs**, B.Sc., Newnham College **Alfred Senn**, London Hospital; **Christopher James Lewen Sharp**, St. Paul's School; **Thomas Archibald Shaw**, Guy's Hospital and Mill Hill School; **Abraham Isaac Silverman**, Middlesex Hospital; **Leonard Smalley**, St. Thomas's Hospital; **George Morris Stoker**, Guy's Hospital; **Edward Howard Strange**, University College, Cardiff; **William Hedley Summerskill**, Guy's Hospital; **Arthur Cleve Damian Telfer**, St. Bartholomew's Hospital; **Wenefride Thompson**, London (Royal Free Hospital) School of Medicine for Women; **Estlin Hugh Weatherall**, St. Bartholomew's Hospital (distinction in Biology); **Leslie Ralph Augustus Wells**, Guy's Hospital; **Enid Margaret Williams**, Swansea Technical College and King's College; **Trevor Morgan Raleigh Williams**, Swansea Technical College and University College; **Henry Norman Witham**, St. Thomas's Hospital; and **Jacob Elias Zaitlin**, London Hospital.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At examinations held recently the following candidates were successful:—

FIRST PROFESSIONAL EXAMINATION.

Chemistry and Physic.—Barsoum Dous, King's College; John Caradoc Evans, London Hospital; Barnett Goldfoot, St. Bartholomew's Hospital; Frank Guiver, London Hospital; Frederick Richard Hall, St. Thomas's Hospital; Strafford Smith Hewitt, St. Mary's Hospital; Archibald Lodge Percy Jeffery, Merchant Taylors' School; Evan Thomas Lloyd, Guy's Hospital; Elizabeth Kathleen Mackay and Norah Katharine Priestley, London School of Medicine for Women; Isaac Rosenberg, Guy's Hospital; Hans Rundstrom, King's College; James Mortimer Schofield, St. Mary's Hospital; Joseph Stanley Thomas, London Hospital; William John Vickers, Birmingham University; and May Grant Williams, London School of Medicine for Women.

Physics.—Jose Roberto Azurdia, Liverpool University; Montague Hirch Buirski, London Hospital; Henry Thomas Chiswell, Guy's Hospital; Octavio de Felix Pedroso, London Hospital; John Harley Piddock, Birmingham University; Tewfik Yusif Suliman, King's College; and Donald Radcliffe Thompson, London Hospital.

Chemistry.—William Laing Dunlop and Edward Richard Hughes, Liverpool University; Joseph Sonenberg-Bergson, King's College; and Daisy Cantra Wallace, Birkbeck College.

Biology.—Douglas Robert Ainsworth, Manchester University; Samuel Edward Amos, St. Thomas's Hospital; Jose Roberto Azurdia and William Ryding Bennette, Liverpool University; Ernest Gower Bryant, Manchester University; Samuel Bacon Chambers, University College, Southampton; Leslie Charles Frederick Chevens, St. Thomas's Hospital; Abdallah Yakub Dowek, Manchester University; William Laing Dunlop, Liverpool University; John Caradoc Evans, London Hospital; Riad Akhnookh Fanous, Manchester University; Leslie Joseph Gabe, Middlesex Hospital; John Hurndall Gann, London Hospital; Strafford Smith Hewitt, St. Mary's Hospital; Janet Hughes, South Western Polytechnic; Gerald Israelstam, London Hospital; Frederick James, Charing Cross Hospital; Archibald Louis Percy Jeffery, Merchant Taylors' School; Eric John Llewellyn Jones-Evans, St. Thomas's Hospital; Harold James Lyon, Guy's Hospital; Elizabeth Kathleen Mackay, London School of Medicine for Women; Horace Abe Nathan, South-Western Polytechnic; Hilda Margaret Neal, Royal Free Hospital; John Hurley Piddock, Birmingham University; Francis Louis Rayner and Isaac Rosenberg, Guy's Hospital; Hans Rundstrom, King's College; James Mortimer Schofield, St. Mary's Hospital; Edgar James Targett, Birmingham University; Joseph Stanley Thomas, London Hospital; William Henry Turner, Guy's Hospital; and Charles Henry White, Birmingham University.

SECOND PROFESSIONAL EXAMINATION.

Anatomy and Physiology.—John Harrison Allan, Liverpool University; George Wilfred Almeyda, London Hospital; Douglas Albert Raoul Aufranc, Middlesex Hospital; John Binford Barnett, Birmingham University; Richard Alec Dudley Jefferson-Bernhardt, Middlesex Hospital; Sarah Aileen Florence Boyd-Mackay, London School of Medicine for Women; William Mark Brown, Guy's Hospital; Harris Cohen, University College, Cardiff; Hyman Solomon Cohen, London Hospital; Morris Cohen, Guy's Hospital; Cecil Gerald Sedgeley Corner, Madras Medical College; John Paul de Silva, London Hospital; Theodore Henry Dobrashian, University College; Keith Mitchell Keitley Duff, Guy's Hospital; Cecil Weldon Rimpey, London Hospital; Gwilym Pennant Evans, St. Mary's Hospital; James Fanning, London Hospital; Lucie Gamford, Madras Medical College and King's College; William Bertram Hargreaves, Aberdeen and Manchester Universities; William George Hay, South African College and Guy's Hospital; Arthur

Robert Hill, Middlesex Hospital; Reginald Walter Patrick Hosford, St. Bartholomew's Hospital; Gravdon Hume and Mahmoud Fahmy Ismail, Guy's Hospital; George Valentine Chapman Last, Liverpool University; Hyman Jacob Levy, University College, Cardiff, and St. Bartholomew's Hospital; Elisabeth Esther McCulloch, Liverpool University; Ambadi Krishna Menon, Madras Medical College and London Hospital; Amin Mohamed Mishad, King's College; Eva Morton, London School of Medicine for Women; James Lucius Camillo O'Flyn, University College, Cardiff, and St. Bartholomew's Hospital; Evan Albert Idris Phillips, University College; Leslie Penhall Phillips, Henry Christoffers Powell, and Charles Nathaniel Read, King's College; John Charles Ryder Richardson, London Hospital; Albert Ernest Sawday and Harry Norman Schapiro, Guy's Hospital; Campbell Shaw, St. Bartholomew's Hospital; Latif Abdallah Simaika, Cairo and St. Bartholomew's Hospital; Yousif Ahmed Sunbul, St. Mary's Hospital; Beriah Melbourne Gwynne Thomas, University College, Cardiff; George Marston Trist, King's College; Alfred Douglas Weeden, Middlesex Hospital; Gladys Mary Thurlow Williams, Cardiff, and Birmingham University; John Edward Wright, Guy's Hospital; Owen Waller James Wynne, Dublin and King's College; and Alfred Ernest Young, Bristol University.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—The second series of lectures on the Anatomy of the Human Body will be delivered by Professor Arthur Keith, Conservator of the Museum, for first-aid and ambulance students, at 5 P.M., in the theatre of the College in Lincoln's Inn Fields, on Mondays, Wednesdays, and Fridays, commencing on Monday next, Jan. 15th. Anatomical preparations and specimens, used for purposes of illustration, will be placed on exhibition in the theatre from 3 to 5 P.M. on each lecture day. On the following day the same preparations will be placed in the hall of the Museum, where they may be studied between the hours of 10 A.M. and 5 P.M.

At the Preliminary Science Examination for the Licence in Dental Surgery the following candidates were approved in the undermentioned subjects:—

Chemistry and Physics.—Reginald James Hooker, Municipal Technical College, Brighton; Elisha Clemens Keet, South African College; Phillip Heygate Knowles, Reading School; George Levy, Guy's Hospital; Peter John Morrison, South African College and Guy's Hospital; and George Edward Smith, Liverpool University.
Chemistry.—Levi Austin Bavan, University of North Wales, Bangor; and Gilbert James Burbery Rowe, Municipal College, Bournemouth.
Physics.—Gerald Fraser Smith, Middlesex Hospital.

ROYAL MEDICAL BENEVOLENT FUND.—At a meeting of the committee held on Dec. 12th, 1916, 30 cases were considered, and £317 15*s.* granted to 28 of the applicants. The following is a summary of the cases relieved:—

Widow, aged 44, of M.B. Lond. who practised in London and died in August, 1916. Owing to the war it was impossible to sell the practice. Applicant lives in own house, which is to be sold, and when her affairs are settled her income will only be about £120 a year. Has two children, aged 8 and 9. Wants help towards the education of her son who is a candidate for Epsom, but not likely to be elected for over a year. Voted £5.—L.R.C.P. Edin., married, who practised at Bervie, N.B. Owing to ill health his earnings have only been about £70 per annum for some time, and his wife, aged 70, is now blind, and a daughter who was a housekeeper has had to give up her post so as to be able to nurse her father and mother. Voted £24 in two instalments.—Daughter, aged 69, of M.R.C.S. Eng. who practised at Cambridge and died in 1887. Applicant was able to earn a living by taking in paying guests on the south-east coast until the war commenced, but since has not been successful, and has had to give up her house. Only income £35 per annum. Relieved once, £12. Voted £12 in 12 instalments.—Daughter, aged 70, of M.R.C.S. Eng. who practised in London and died in 1875. Applicant was a governess in Russia when the war commenced, and all her savings were in a Berlin bank. For the last two years has earned a living by clerical work, but her eyesight has now failed, and has had to give it up. Only income a pension of £30 from another charity. Relieved twice, £24. Voted £12 in 12 instalments.—Daughter, aged 50, of M.R.C.S. Eng. who practised in India and London and died in 1813. Applicant left unprovided for, and owing to ill-health unable to earn a living. Only income £22 per annum. Relieved three times, £20. Voted £10 in two instalments.—Daughter, aged 58, of M.R.C.S. Eng. who practised at Hammersmith and died in 1908. Owing to ill-health unable to work, and only income occasional help from friends and from the Guild. Relieved nine times, £122. Voted £18 in 12 instalments.—Widow, aged 59, of L.S.A. Lond. who practised at Bournemouth and died in 1913. Has endeavoured to earn a living by taking in lodgers, but since the war has been unsuccessful, and has only received £3 this year. Has received a gift of £26 from another society. Relieved twice, £24. Voted £12 in 12 instalments.—Daughter, aged 54, of M.R.C.S. Eng. who practised in London and died in 1831. Left without means and very delicate, and her small income has had to be expended on medical attention. Income £25 from another society. Relieved seven times, £74. Voted £10 in two instalments.—Daughter, aged 51, of M.R.C.S. Eng. who practised at Gillingham and died in 1914. Applicant left without means, her father having been an annuitant of the Fund for some years. Never trained to work and can only earn a few shillings a week in a domestic capacity. Relieved three times, £29. Voted £12 in 12 instalments.—Widow, aged 74, of M.R.C.S. Eng. who practised at Rye and died in 1891. Applicant's income is not more than £50 per annum, and she has cataract in both eyes. Her two daughters are married and unable to help her. Relieved once, £12. Voted £12 in 12 instalments.—Widow, aged 55, of M.R.C.S. Eng. who practised at Yelverton and died in 1908. Left without means and endeavours to make a living by taking in boarders, but is not successful. Her eyesight is bad. Relieved ten times, £119. Voted £12 in 12 instalments.—Daughters, aged 44, 51, and 56, of M.R.C.S. Eng. who practised at Bodmin and died in 1912. On the death of the father the life interest in an estate ceased, and the only certain income of the applicants is £5 each. Two suffer from bad sight and the other quite unable to work. Relieved once, £18. Voted £18 in 12 instalments jointly.—Daughter, aged 70, of M.D. Lond. who practised at Cheltenham and died in 1879. Applicant was left without means and has always had bad health, and is now suffering from acute rheumatism. Only income £39 per year from another charity and a small annuity. Relieved three times, £36. Voted £12 in 12 instalments.—Widow, aged 43, of M.R.C.S. Eng. who practised in North Wales and died in 1910. Applicant was left without means and had two young children, now aged 10 and 7 years. Lives with her aged parents who are not well off, and can only provide a home. Relieved five times, £50. Voted £10 in two instalments.—Widow, aged 75, of L.S.A. Lond. who practised in Bermondsey and died in 1887. Applicant managed up to the commencement of the war by keeping a boarding house on the south-east coast, but has had to close it down, and is still responsible for various charges against the house. Two children who help all they can. Relieved once, £15. Voted £2 and referred to the Guild.—Widow, aged 52, of M.D. Dub. who practised at Widnes and died in 1915. Left totally unprovided for with three children, only one of whom is working. Applicant's health is very indifferent. Allowed to live rent free in a friend's house. Relieved once, £10. Voted £12 in 12 instalments.—Daughter, aged 56, of L.R.C.S. Glasg. who practised at Glasgow and died in 1883. Endeavours to earn a living by teaching music, but cannot obtain sufficient pupils. Only permanent income £25. Recommended by the Glasgow branch of the Guild. Relieved once, £12. Voted £12 in 12 instalments.—Widow, aged 58, of L.S.A. Lond. who practised at Limehouse and died in 1894. Applicant was left unprovided for with two young daughters, both of whom are now working, but only able to earn a little. Earns a little by needlework, but finds it difficult to meet expenses. Relieved nine times, £38. Voted £12 in 12 instalments.—Widow, aged 71, of M.D. Edin. who practised at Cambridge and died in 1908. Applicant endeavours to make a living by taking in boarders, but is not successful. Friends provide £18 per annum. Relieved six times, £48. Voted £12 in 12 instalments.—Wife, aged 36, of M.B. Dub. who practised in various places in England and Ireland. Applicant had to leave him 18 months ago on account of his habits and cruelty. One child 1½ years old. Applicant is a trained nurse, but unable to take permanent work on account of the child. Relieved once, £9. Voted £5 in two instalments.—Widow, aged 57, of L.S.A. Lond. who practised at Islington and died in 1905. Applicant left unprovided for with two sons, both of whom joined the Army; one was killed and the other is missing. Applicant is nearly blind, and health is very precarious. Relieved 12 times, £145. Voted £18 in 12 instalments.—Daughter, aged 64, of M.D. Edin. who practised in London and died in 1873. Applicant has two sisters, and they endeavour to make a living by keeping a boarding house. The recent death of the mother has depleted the family income, as she had a pension which died with her, and the high cost of living makes it difficult to get on. Relieved once, £10. Voted £10.—Daughter, aged 60, of M.R.C.S. Eng. who practised at Yoxford and died in 1893. Has always had bad health, and two relatives who used to help her have died. Only income a pension of £29 from another society. Relieved eight times, £80. Voted £12 in 12 instalments.—Daughter, aged 59, of L.R.C.P. Lond. who practised at Brierley Hill and died in 1912. Has never been able to work through ill-health and has recently fractured her ankle. Only income a pension from another society of £25. Relieved nine times, £65. Voted £12 in 12 instalments.—Daughter, aged 48, of M.B. Edin. who practised at Southampton and died in 1896. Applicant is a trained midwife, but owing to suffering from Bright's disease and heart trouble is unable to work. Only income 10*s.* 6*d.* per week allowed by friends. Relieved three times, £24. Voted £12 in 12 instalments.—Widow, aged 62, of L.R.C.P. Irel. who practised at Liverpool and died in 1885. Applicant earns a living by nursing, but owing to indifferent health and a bad cough unable to obtain permanent work, and only earned £20 during the year. Relieved four times, £23. Voted £12 in 12 instalments.

The committee also granted special war-time Christmas gifts of £1 each to 150 annuitants and 120 grantees. Subscriptions may be sent to Dr. Samuel West, hon. treasurer, at 11, Chandos-street, Cavendish-square, London, W.

THE King has sanctioned the following promotions in the Order of the Hospital of St. John of Jerusalem in England:—Colonel Sir John Rose Bradford, K.C.M.G., C.B., F.R.S., A.M.S., Colonel Alfred Percy Blenkinsop, C.B., A.M.S., Colonel Sinclair Westcott, C.B., C.M.G., A.M.S., and Surgeon-General John Chislet Culling, A.M.S., to be Knights of Grace; and Lieutenant-Colonel William Richard Blackwell, R.A.M.C., and Fleet-Surgeon Robert William Glennan Stewart, R.N., to be Esquires.

ROYAL SOCIETY OF ARTS (JOHN-STREET, ADELPHI).—Amongst the lectures announced for the coming session are the following:—W. A. M. Goolie, honorary secretary of the National Committee, on "Relief Work in Belgium" (Jan. 24th); Dr. R. Fortescue Fox on "The Future of British Spas" (Feb. 7th); Lawrence Chubb, secretary of the Commons Preservation Society, on "High-ways and Footpaths." The time in each case is 4.30 P.M. Admission is by ticket.

ROYAL SANITARY INSTITUTE.—A discussion will take place on Wednesday, Jan. 31st, at 4.30 P.M., at 90, Buckingham Palace-road, on the physical welfare of children after infancy from the national, social, and public health standpoints. The debate will be opened by Dr. W. Leslie Mackenzie, medical member, Local Government Board for Scotland. The chair will be taken by Sir George Newman, chief medical officer, Board of Education.

THE LATE SIR F. W. BORDEN.—Frederick William Borden, who died last week in his seventieth year, came of medical parentage and was a medical graduate of Harvard, and entered the Canadian Army Medical Service as assistant surgeon to the 68th Militia Regiment (King's County) in 1869. He rose to the rank of surgeon lieutenant-colonel and honorary colonel, and was made an honorary surgeon-general of the Imperial Army in 1911. He sat for 33 years in the Canadian Parliament.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

CORDINGLEY, GRACE, L.S.A., has been appointed Pathologist to the Venereal Diseases Department, Royal Free Hospital.

DINNICK, O. T., M.R.C.S., L.R.C.P. Lond., Senior Assistant to the Venereal Diseases Department, Royal Free Hospital.

GREEN, EDITH M. N., M.B., B.S. Lond., Senior Assistant to the Venereal Diseases Department, Royal Free Hospital.

TOCKER, J., M.B., C.M., Medical Officer for the Morthoe District by the Barnstaple (Devon) Board of Guardians.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BATH, EASTERN DISPENSARY.—Resident Medical Officer. Salary £140 per annum, with furnished rooms, &c.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.—Resident Medical Officer and House Surgeon for six months. Salaries £200 and £150 per annum respectively, with board, &c.

BOLTON INFIRMARY AND DISPENSARY.—Female Second House Surgeon. Also Female Third House Surgeon. Salaries £200 and £180 per annum, respectively, with board, &c.

BRIDGWATER HOSPITAL.—House Surgeon. Salary £120 per annum, with board, &c.

BRISTOL GENERAL HOSPITAL.—House Surgeon for six months. Salary at rate of £175 per annum, with board, &c.

CARDIFF, KING EDWARD VII.'s HOSPITAL.—House Surgeon for six months.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—Second House Surgeon. Salary £150 per annum, with board, &c.

DORSET COUNTY COUNCIL.—Temporary Clinical Tuberculosis Officer. Salary £350 per annum.

GUILDFORD, ROYAL SURREY COUNTY HOSPITAL.—House Surgeon. Salary £200 per annum, with board, &c.

HARROGATE, FURNESS AUXILIARY HOSPITAL.—Resident Medical Officer. Salary £35 per month, with board, &c.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.—House Surgeons, Assistant Casualty Medical Officer, and House Physician, unmarried. Salary at rate of £60 per annum each, with board, &c.

HUDDERSFIELD COUNTY BOROUGH EDUCATION AUTHORITY.—Assistant School Medical Officer. Salary £350 per annum.

LEAMINGTON SPA, WARNEFORD GENERAL HOSPITAL.—Junior Resident Medical Officer. Salary £150 per annum, with board, &c.

LEYTON URBAN DISTRICT COUNCIL EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer and Temporary Assistant Medical Officer of Health. Salary at rate of £350 per annum.

LIVERPOOL, BROWNLOW HILL INSTITUTION.—Resident Assistant Medical Officer. Salary at rate of £300 per annum, with rations, &c.

MANCHESTER COUNTY ASYLUM, Prestwich.—Locum Tenens. Salary £7 7*s.* per week, with board, &c.

MANCHESTER, HULME DISPENSARY, Dale-street, Stretford-road.—House Surgeon. Salary £250 per annum, with apartments, &c.

NEWCASTLE-UPON TYNE, ROYAL VICTORIA INFIRMARY.—Female Assistant in Venereal Diseases Department

NEW HOSPITAL FOR WOMEN, Euston-road.—Female Senior Clinical Assistant in Out-patient and Ophthalmic Departments.

NORTHAMPTON GENERAL HOSPITAL.—House Surgeon. Salary £150 per annum, with board, &c.

NOTTINGHAM AND MIDLAND EYE INFIRMARY.—Female House Surgeon.

PADDINGTON GREEN CHILDREN'S HOSPITAL, London, W.—Clinical Assistant in Out-patients' Department, Monday and Thursday mornings.

PLAISTOW HOSPITAL FOR INFECTIOUS DISEASES, London, E.—Temporary Resident Medical Officer. Salary at rate of £250 per annum, and all found.

PORTSMOUTH BOROUGH MENTAL HOSPITAL.—Locum Tenens Assistant Medical Officer. Salary 7 guineas per week, with board, &c.

QUEEN MARY'S HOSPITAL FOR THE EAST-END, Stratford.—House Surgeon.

ROCHESTER, ST. BARTHOLOMEW'S HOSPITAL.—Clinical Assistant. Salary at rate of £110 per annum, with board, &c.

ROXBURGH DISTRICT ASYLUM, Melrose.—Medical Superintendent. Salary £500 per annum, with residence, &c.

ROYAL COLLEGE OF SURGEONS.—Election to the Court of Examiners.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, W.—Resident Surgical Officer.

ST. MARYLEBONE GENERAL DISPENSARY.—Resident Medical Officer. Salary £150 per annum, with furnished apartments, &c.

SHEFFIELD ROYAL HOSPITAL.—Assistant House Surgeon, unmarried. Salary £120 per annum, with board, &c.

SOUTH LONDON HOSPITAL FOR WOMEN, 103, South Side, Clapham Common, S.W.—Female House Physician for six months. Salary at rate of £100 per annum, with board, &c.

SURREY EDUCATION COMMITTEE.—Temporary School Dentist. Salary £300 per annum.

VENTNOR, ISLE OF WIGHT, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST ON THE SEPARATE PRINCIPLE.—Assistant Resident Medical Officer.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—House Surgeon for six months. Salary at rate of £200 per annum, with board, &c.

WEST-END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W.—House Physician. Salary £250 per annum, with board, &c.

WORCESTER, CITY OF.—Female Temporary Assistant Medical Officer. Salary £350 per annum.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Paignton, Devon; Foyers, Inverness-shire; Wartle, Aberdeenshire; and Frodsham, Cheshire.

Births, Marriages, and Deaths.

BIRTHS.

BARROW.—On Jan. 4th, at Bishopton, Lockgilphead, Argyllshire, the wife of Surgeon Murray Barrow, R.N., of a son.

DENHAM.—On Jan. 3rd, the wife of Captain Charles Holmes Denham, R.A.M.C., at Ladbroke-terrace, of a son.

EWART.—On Jan. 2nd, at North-street, Chichester, the wife of Dr. David Ewart, of a son.

LAWRIE.—On Jan. 6th, at Ryde House, Woking, the wife of John Lawrie, M.B., C.M., of a son.

SUTTON.—On Jan. 4th, at a nursing home, Southsea, the wife of Captain E. A. Sutton, M.C., R.A.M.C.—a daughter.

MARRIAGES.

CAMPION-SHELLEY.—On Dec. 30th, 1916, at St. Mark's Church, Alexandria, Captain Rowland Burnell Maule Campion, R.A.M.C., to Kathleen Sybil, daughter of Edgar Shelley, of London and Melbourne.

OKELL—ROBERTS.—On Jan. 2nd, at Holy Trinity Church, Stratford-on-Avon, Captain Charles Cyril Okell, M.C., R.A.M.C., to Dorothy Gladys, youngest daughter of the late W. Owen Roberts, Pulrose House, Isle of Man.

RADLEY—CLAYTON-SMITH.—On Nov. 30th, 1916, at St. Thomas's Cathedral, Bombay, Captain S. B. Radley, F.R.C.S., R.A.M.C., to Gladys, daughter of W. E. Clayton-Smith, of Pontefract.

SHERRIS—JONES.—On Dec. 30th, 1916, at St. George's, Tufnell Park, N., Captain Cyril Sherris, R.A.M.C., to Dorothy, youngest daughter of the late Charles G. Jones, formerly of Exeter-road, Brondesbury.

DEATHS.

BAZALGETTE.—On Jan. 7th, at Brent Knoll, Somerset, after a short illness, Sidney Bazalgette, M.R.C.S., L.R.C.P. Lond.

JOHNSTON.—On Jan. 4th, at 31, Wavelev-street, Nottingham, James Hunter Johnston, M.B., M.S. Edin., aged 51.

MORRIS.—On Jan. 6th, at Parkside, Feltham, Middlesex, Colin Dwight Morris, M.R.C.S., L.R.C.P., aged 58.

TOWNSEND.—On Jan. 2nd, at Clontymon, Cork, Sir Edmond Townsend, K.C.B., C.M.G., Surgeon-General (retired), aged 71.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

ARNOLD, EDWARD, London.
Medical Diseases of the War. By Arthur F. Hurst, M.A., M.D. Oxon., F.R.C.P., Temporary Major, R.A.M.C. 6*s.* net.

BAILLIÈRE, J. B., ET FILS, Paris.
Les Appareils Plâtrés. Par les Dr. Calvé, Chef du Service Central de Physiothérapie de la Région du Nord, Chirurgien-Assistant de l'Hôpital Maritime de Berck-sur-Mer; et Dr. Galland, Interne des Hôpitaux de Paris. 1 Vol. in-18 de 88 pages. 2 fr. 60.

CASSELL AND CO., LIMITED, London.
The Nation's Health: The Stamping Out of Venereal Disease. By Sir Malcolm Morris, K.C.V.O. 3*s.* 6*d.* net.

CHURCHILL, J. AND A., London.
Poverty and its Vicious Circles. By Jamieson B. Hurry, M.A., M.D. 5*s.* net.

CONSTABLE AND CO., London.
Some Modern Methods of Ventilation. With Special Reference to Public Buildings. By R. Grierson, A.M.I.M.E., A.M.I.E.E., &c. 8*s.* 6*d.* net.

DANIEL, C. W., Limited, London.
Initis, Nutrition and Exercises (47 Photographs). By A. Rabagliati, M.A., M.D., F.R.C.S. Ed. 10*s.* 6*d.* net.

LIPPINCOTT (J. B.) CO., London and Philadelphia.
International Clinics. Vol. III., 1916. Edited by H. R. M. Landis, M.D., and others. 35*s.* net per 4 quarterly vols.

LONGMANS, GREEN, AND CO., London.
On Causation, with a chapter on Belief. By Charles A. Mercier, M.D., F.R.C.P., F.R.C.S. 4*s.* net.

LORD BALTIMORE PRESS, Baltimore.
Proceedings of the American Medico-Psychological Association at Old Point Comfort, Va., May, 1915.

MACMILLAN AND CO., London.
A Text-book of Organic Chemistry for Students of Medicine and Biology. By E. V. McCollum, Ph.D. 10*s.* net.

ROCKEFELLER INSTITUTE, New York.
Studies from the Rockefeller Institute for Medical Research Reprints. Vol. XXIV.

UNIONE TIPOGRAFICO-EDITRICE TORINESE, Torino, Milano, Napoli, Palermo, Roma.
Trattato dei Neoplasmi Maligni, preceduto da uno studio sulle Infezioni Chirurgiche in Generale. Dr. D. B. Roncali. Vol. Secondo. Lire 34.

UNIVERSITY OF CHICAGO PRESS. (London Agents: CAMBRIDGE UNIVERSITY PRESS.)
The Control of Hunger in Health and Disease. By Anton Julius Carlson, Professor of Physiology in the University of Chicago. 9*s.* net.

WILEY, JOHN, AND SONS, New York. CHAPMAN AND HALL, LTD., London.
Manual of Psychiatry. By J. Rogues de Fursac, M.D., and A. J. Rosanoff, M.D. Fourth edition, revised and enlarged. 10*s.* 6*d.* net.

Notes, Short Comments, and Answers to Correspondents.

HEALTH OF CEYLON.

A REPORT prepared by Mr. E. Sueter, Assistant Colonial Secretary, on the affairs of Ceylon for the year 1915, states that the estimated population of the island (exclusive of the military and shipping) is about 4,424,300, an increase of nearly 107,600 on that of the previous year, due to an excess of about 51,100 births over deaths and 56,000 arrivals over departures of Indian coolies. There are 113 males to every 100 females in the population of Ceylon. The birth-rate for the year was 37·0 per 1000 and the death-rate 25·0 per 1000, this latter being the lowest on record since 1898, when improved registration began, with the exception of the rate in 1904, when it was only 0·1 less. 171 infants under one year died to every 1000 born, against an average of 195. This rate is the lowest recorded during the preceding decennium. The proportion of deaths in the general community from certain principal causes to a million of the estimated population was as follows: Infantile convulsions, 2595; diarrhœa, 2465; bronchitis and pneumonia, 1146; phthisis and other forms of tuberculosis, 952; dysentery, 774; ankylostomiasis, 468; malaria and malarial cachexia, 390; premature birth and congenital defects, 307; cancer, 92; enteric fever, 88; and small-pox, 35. Plague, which broke out in 1914 for the first time in the history of Ceylon, is still continuing, though the victims claimed in the year under review are very much less, as will be seen by the following record: Total cases in 1914, 413; ditto in in 1915, 139; total deaths in 1914, 381; ditto in 1915, 128. On the other hand, and contrary to expectations, there was no diminution in the virulence of the disease, the total case mortality being 92 per cent., as in the previous year. 108 deaths per million were due to accidental drowning, 80 to falls from trees, and 53 to snake-bite; 342 deaths were attributed to homicide, against an average of 181. This corresponded to a rate of 77 per million—the highest ever recorded in Ceylon—and was due to the riots in June. The number of executions, too, rose to 76 from an average of 29, owing to the same cause.

There are 78 Government hospitals (in addition to the lunatic and leper asylums) equipped with modern hospital furniture and surgical appliances. The owners of estates have also provided 54 estate hospitals and 353 dispensaries. Four new hospitals are under construction. A general rebuilding scheme is in contemplation for the improvement of the Medical College. The full course of training for medical students is five years; a diploma in medicine, surgery, and midwifery (which can be registered in the United Kingdom) is granted to successful medical students. In Colombo there are a bacteriological institute, an ophthalmic hospital, a lying-in home, a hospital for women and children, and one for infectious diseases; there is also an establishment for the manufacture of calf lymph. The leper asylum, situated six miles from Colombo, contained 402 patients at the end of the year; the total treated during 1915 numbered 509. A smaller establishment for lepers exists at Kalmunai and has accommodation for 30, and it is now proposed to establish a leper colony at Mantivu in the Eastern Province.

The highest annual rainfall registered was at Carney Estate, Ratnapura, which had a total of 266·8 inches, and the lowest was at Mantota in Mannar, which had a total of 25·85. The annual rainfall at Colombo (Cinnamon Gardens) was 96·81 inches. The station showing the highest mean shade temperature for the year was Trincomalee with 84·4° F. and the lowest Nuwara Eliya with 60·7°. The figures for Colombo and Kandy were 81·0° and 77·1° respectively.

STEAM-DISINFECTING APPARATUS.

WE have received from the Grampian Engineering Company, Limited, of Stirling, N.B., and 43, Aldwych, London, W.C., an interesting brochure on "Modern Steam Disinfection," in which are described the "Velox" high-pressure steam and combined current-steam and vacuum-formalin disinfectors. The merits of these methods of physical disinfection are closely discussed and full illustrations of the various types of apparatus are given. Practical experiments are quoted demonstrating the sterilising efficiency of the machines.

T. B.—The statement was a definite and precise one and made as long ago as August 1st, 1916. In reply to a question by Mr. J. Anderson in the House of Commons, Mr. Forster stated as follows: "Instructions have been issued to recruiting medical boards to ask each man definitely whether (*a*) he has been under treatment in a sanatorium; (*b*) his name has been notified to the sanitary authorities as suffering from consumption? No man whose answer to either of these questions in the affirmative will be taken into the Army, but it will obviously be necessary to verify his statements." Mr. Forster went on to add that the Local Government Board had arranged for local tuberculosis officers to supply particulars of all men of military age on the tuberculosis registers, and that these particulars would be supplied to the recruiting authorities with instructions that such men were not to be accepted for service. In cases of doubt the advice of tuberculosis officers was to be asked for.

N. K. M.—A special course on the diagnosis and treatment of venereal diseases is being held for London panel practitioners at the Rochester Row Military Hospital, S.W., and this is open to all medical men. Application should be made to Lieutenant-Colonel L. W. Harrison, R.A.M.C., at the hospital. Lectures have been announced at the London and Guy's Hospitals, and will doubtless be arranged at other metropolitan and provincial hospitals. Details will be given in our column devoted to control of venereal diseases. "A System of Syphilis," edited by D'Arcy Power and Murphy (Oxford Medical Publications, second edition. 1914. Five volumes. £2 2*s.*) is the most complete work in English on the subject. "A Manual of Venereal Diseases" (same publisher, second edition; 1913; 10*s.* 6*d.* net) is a practical volume. The Report of the Royal Commission on Venereal Diseases is a mine of information on the whole subject.

ERRATUM.—In the Annus Medicus in THE LANCET of Dec. 30th, 1916 (p. 1116), under the heading of "Army Medical Service," we referred to the duplication of the office of Director-General, and included the following phrase: "While Sir Alfred Keogh, who had been Director-General up to 1910, and who was in 1915 acting as Chief Commissioner for the British Red Cross Society in France and Belgium, became Director-General of the Army Medical Service at home." The year should have been stated as 1914 and not 1915.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, Jan. 16th.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for Election to the Fellowship.

Wednesday, Jan. 17th.

HISTORY OF MEDICINE (Hon. Secretaries—J. D. Rolleston, Charles Singer): at 5 P.M.
Exhibition of Books, Portraits, &c. (at 4.30 P.M.).
Paper:
Mr. R. R. Steele: A Mediæval Panacea.

Thursday, Jan. 18th.

DERMATOLOGY (Hon. Secretaries—J. E. R. McDonagh, Henry MacCormac): at 5 P.M.
Cases (at 4.30 P.M.).

Friday, Jan. 19th.

ELECTRO-THERAPEUTICS (Hon. Secretaries—E. P. Cumberbatch, Robert Knox): at 8.30 P.M.
A CLINICAL EVENING will be held in the Electrical Department of St. Bartholomew's Hospital.

LONDON DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY.—4.30 P.M., Clinical Cases will be shown by Capt. W. Griffith, R.A.M.C., Dr. J. L. Bunch, Dr. W. K. Sibley, Dr. C. Kempster, and Dr. M. Dockrell. Paper:—Dr. C. Kempster: The Action of X Rays upon Diseases of Bacterial Origin.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. B. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. B. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

ST JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.

THURSDAY.—6 P.M., Chesterfield Lecture:—Dr. M. Dockrell: Tuberculosis of the Skin and Lupus Erythematosus.

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY.—4 P.M., Lecture I.:—Miss J. Lane-Claypon, M.D.: Principles of Organisation and Administration in Child Welfare Work. Lieut.-Gen. Sir Robert Baden-Powell, K.C.V.O., and Mr. F. J. Willis, C.B., have promised to take part in the discussion.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.

TUESDAY.—3 P.M., Prof. C. S. Sherrington: The Old Brain and the New Brain, and their Meaning. (Lecture I.)

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Jan. 10th, 1917.

Date.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Tem.	Wet Bulb.	Dry Bulb.	Remarks.
Jan. 4	...	71	49	48	45	48	Cloudy
,, 5	...	57	45	39	37	39	Fine
,, 6	0·25	46	43	39	39	41	Cloudy
,, 7	...	50	47	35	34	35	Cloudy
,, 8	0·17	43	41	35	37	40	Overcast
,, 9	0·10	48	40	38	36	37	Overcast
,, 10	...	54	38	33	32	33	Cloudy

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON, W.C.

MANAGER'S NOTICES.

VOLUMES AND CASES.

VOLUMES for the second half of the year 1916 will be ready shortly. Bound in cloth, gilt lettered, price 16*s.*, carriage extra.

Cases for binding the half-year's numbers (inland edition) are now ready. Cloth, gilt lettered, price 2*s.*, by post 2*s.* 4*d.*

To be obtained on application to the Manager, accompanied by remittance.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d.* The rates of subscription remain as revised in October.

INLAND.

One Year	£1 10 0
Six Months	0 16 0
Three Months ... ... ,,	0 8 0

COLONIES and ABROAD.

One Year	£1 12 6
Six Months	0 17 6
Three Months	0 8 9

Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London County and Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C.

ADVERTISEMENT RATES.

Books and Publications ... ...
Official and General Announcements
Trade and Miscellaneous Advertisements and Situations Vacant ... ...
Five lines and under ... ... 4*s.* 0*d.*

Every additional line, 6*d.*

Situations Wanted: First 30 words, 2*s.* 6*d.*
Per additional 8 words, 6*d.*

Quarter Page, £1 10*s.* Half a Page, £2 15*s.*

Entire Page, £5 5*s.*

Special terms for Position Pages.

Advertisements (to ensure insertion the same week) should be delivered at the Office not later than Wednesday, accompanied by a remittance.

Letters, each with enclosure, are also acknowledged from—

A.—Mr. D. McCrae Aitken, Lond.; Messrs. Armour and Co., Lond.; Dr. T. Agius, Malta; Mr. N. Almond, Kingston-on-Thames; *Archives de Médecine et de Pharmacie Militaires*, Paris, Editor of; Alliance Press Agency, Manchester.

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